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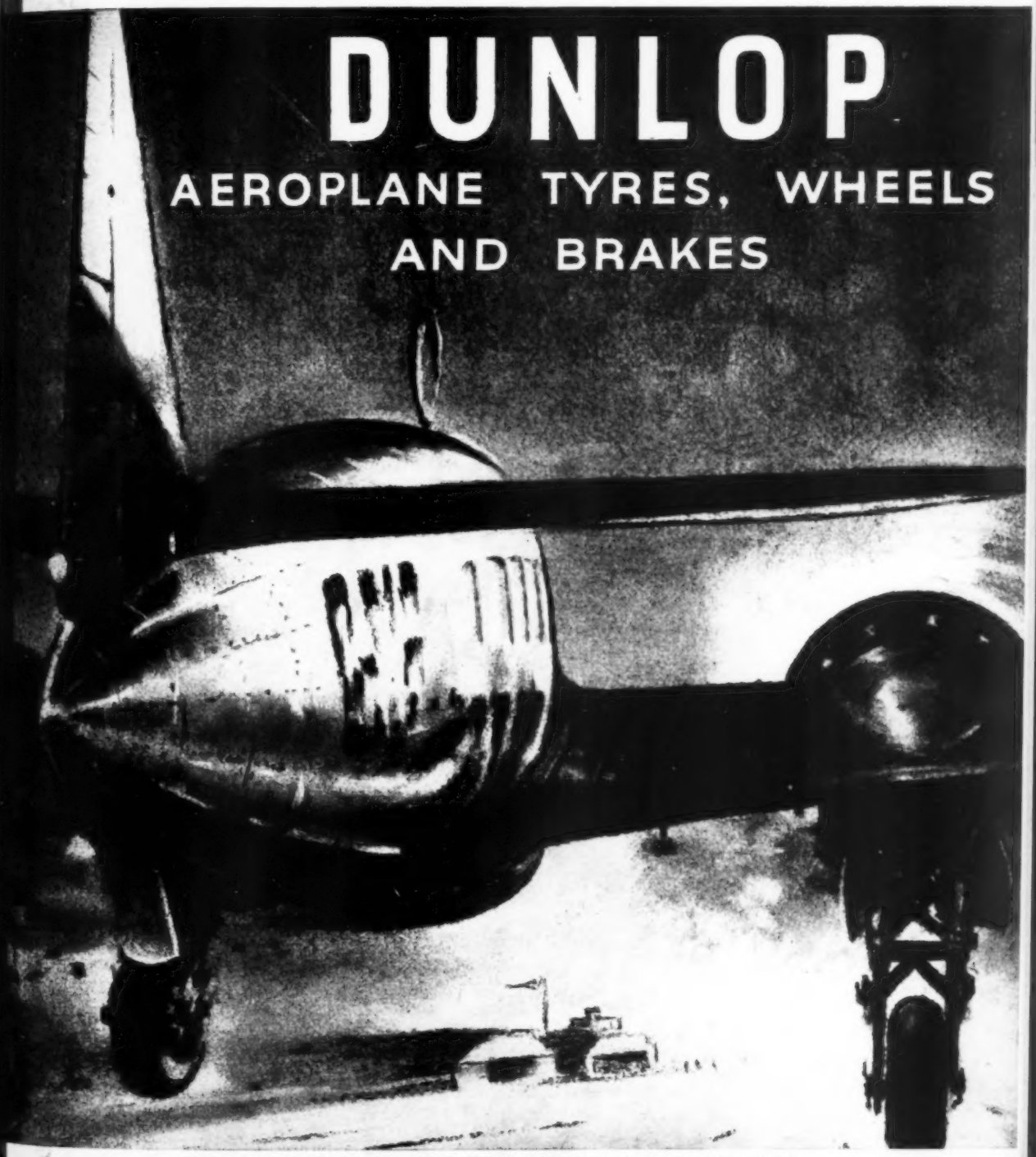

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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

Editor C. M. POULSEN

Managing Editor G. GEOFFREY SMITH

Chief Photographer JOHN YOXALL

Editorial, Advertising and Publishing Offices: DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1

Telegrams: Truditur, Belist, London. Telephone: Waterloo 3333 (50 lines).

BERTFORD ST., COVENTRY. Telegrams: Autocar, Coventry. Telephone: Coventry 5210.

GUILDHALL BUILDINGS, NAVIGATION ST., BIRMINGHAM, 2. Telegrams: Autopress, Birmingham. Telephone: Midland 2971.

260, DEANSGATE, MANCHESTER, 3. Telegrams: Iliffe, Manchester. Telephone: Blackfriars 4412.

26B, RENFIELD ST., GLASGOW, C.2. Telegrams: Iliffe, Glasgow. Telephone: Central 4857.

SUBSCRIPTION RATES: Home and Canada: Year, £1 13 0. 6 months, 16s. 6d. 3 months, 8s. 6d. Other Countries: Year, £1 16 0. 6 months, 18s. 0d. 3 months, 9s. 0d.

No. 1491. Vol. XXXII JULY 22, 1937. Thursdays, Price 6d

Pulling Together

THE coast defence exercises which were held last week along the South Coast from Portsmouth westward mark a considerable advance in the country's preparations for defence. Several times in the last few years have exercises been held which involved two of the fighting Services, but this has been the first one in which all three of them were engaged on a considerable scale. Of course, in exercises held for the Navy and Army each side has always had its own air arm over which the Air Council has no operational control, and therefore it would not be correct to say that the Royal Air Force as such took part in the exercise. No A.O.C. was in a position to issue any orders in those exercises. At Portsmouth three Commanders-in-Chief, one from each of the Services, worked together in their efforts to defeat the Blue Fleet and to save the coast ports. Of course, it does not matter in the least whether their efforts failed or not. Portsmouth was, in fact, heavily bombarded and bombed, and the other ports suffered in lesser degree. That was almost inevitable when the umpires did not order a Blue ship out of the line when it had been so attacked that it would have been sunk or incapacitated in real war. The decks of *Courageous* would have needed heavy armour plating to withstand all the bombing to which they were subjected, and, moreover, one night a submarine fired six torpedoes at her and claimed that the attack was successful. But if one of the carriers had actually ceased to operate the exercise would have lost much of its interest at an early stage, and so its whole object would have been defeated. That object was not to win the war but to give practice to everyone concerned, and particularly to the higher command in its novel experiment in conducting war by a triumvirate. Likewise if all the aircraft which must have been destroyed had actually been forbidden to fly any more, that also would have interfered with the main object.

It was perhaps unfortunate that the Army had no mobile troops engaged, only fixed defences in the heavy batteries, which were largely manned by the Territorial Army. The A.A. guns and the searchlights, both Regular and Territorial, naturally worked under the orders of the Air Officer Commanding-in-Chief. That was why the Blue Force only made one landing and only left its party on shore for a quarter of an hour or so. Landings did not provide practice for anybody except the actual landing party. So one is rather left wondering whether it actually was a triumvirate which was at work in the operations room at Portsmouth, or only in effect Admiral Lord Cork and Air Marshal Joubert de la Ferté. On the Blue side there was no attempt at co-operation at all. The Blue side was just part of the Home Fleet with its own air arm.

Why?

One point in the defence tactics was very noticeable. The Red Air Force attacked practically nothing except the Blue carriers. The Blue cruisers were left for the Red submarines, local flotillas, and fixed batteries to deal with as best they could. It seems quite natural and reasonable that the Blue carriers should be the first targets chosen by the Red bombers and T.B. squadrons, for one thing because they offer such a tempting target, and for another that if one can even partially blind one's enemy one has gone far towards crippling him. But the idea occurs that it may not have been altogether the best tactics to continue to concentrate on the carriers all through the exercise. In sham fighting ships are unsinkable, but in real war it is reasonable to suppose that the flying decks would have been damaged, though at a cost, perhaps a considerable cost, in Red bombers shot down. Would it not have been reasonable tactics and also good practice for the Red bombers to have turned their attention after a while to the Blue cruisers? One wonders, did the Admiral of the Red (in the modern sense of the term) judge that such attacks would have been waste of time, or did the A.O.C.-in-C. have such a carrier-complex that he never thought of bombing anything else? Considering that bombers and submarines were the only striking force at the disposal of Redland, this concentration of

the bombing on the carriers is at least a point to notice.

In past wars the history of combined operations by Navy and Army has not been altogether happy. On the other hand, operations in which one officer commanding-in-chief has had units of the other Service under his command have given no cause for complaint. There are authorities who believe that for the future in such operations as those held last week there ought to be one officer in command of the units of all the three Services. There are obvious difficulties in the way, but it is a possibility that the gains would outweigh the losses. One would like to see that method tried out.

Air Raid Precautions

PORTSMOUTH and Southampton certainly deserve congratulations on the amount of enthusiasm shown by their citizens in preparing to deal with air raids, if there should ever be need to deal with them. The number of volunteers and the amount of equipment which were apparent on the great practice held on the night of Thursday-Friday last week were quite surprising. Gas masks, gas-proof clothing, stretchers, ambulances, ladders, first-aid equipment, decontamination vans, all appeared in ample supplies. Added to this was the remarkable public spirit displayed by householders and motor drivers in dousing their lights. From midnight to 3 a.m. both cities were like cities of the dead, with only a few official cars moving about the empty, inky streets. Even when a "cannon cracker" was fired in a quiet residential street no blinds were drawn back and no lights appeared at curious windows. In fact, the way in which everyone entered into the spirit of the thing was most gratifying.

The object of every rehearsal is to discover faults and to set them right. No sane person expects that everything will go with the utmost degree of efficiency on the first rehearsal, or perhaps even on the twentieth. The officials of the Air Raid Precautions Department of the Home Office were quite frank in telling the privileged spectators before the black-out began at Portsmouth and Southampton that they expected to discover points where improvement was possible. Doubtless they did discover more points than could be realised by the spectators, but to everybody it was obvious that the volunteers need to practise and practise until working in gas masks becomes quite a normal proceeding, and until they have learnt real smartness in handling all their equipment.

This criticism is written in no carping spirit. A beginning must be made, and those cities which have begun early to organise and to practise will reach their goal earlier than those who leave everything until the last moment. The moral is that every city in the kingdom needs to start its preparations without delay, and to keep its practices going.

A STRIKING FORCE : Normally the work of the General Reconnaissance squadrons is to scour the seas round the coasts of Britain and report the presence of enemy ships. During the recent exercises on the South Coast the Ansons of three G.R. squadrons were used as bombers, and here one of these squadrons is seen off the coast of Cornwall flying out to attack the Blue Fleet

The Outlook

A Running Commentary on Air Topics

Taking Risks

AT the time the New York-Paris air race was first announced *Flight* was severely criticised in some quarters for its attitude towards the event. We were told, sometimes in quite impolite terms, that such a great air race was bound to attract tremendous attention and to make everybody discuss air matters and take a keen interest in flying generally, and that, therefore, it was not up to a journal like *Flight* to throw cold water on the project.

From its inception in 1909 *Flight* has regarded aviation as a serious business, as a new development which was bound some day to alter all previous notions concerning speedy travel across seas and continents. Holding that view, we have always deprecated anything in the nature of a "stunt" which might bring flying into disrepute, and we failed to see that the New York-Paris air race could do anything towards furthering the cause of serious aviation; on the other hand, a number of mishaps, or even a single accident, could do untold harm in giving the general public all over the world one more reason, unjustified perhaps, but a reason nevertheless, for pointing the finger of scorn at aviation.

How right *Flight* was in its attitude has now, unfortunately, been only too amply demonstrated by the very regrettable disappearance of Mrs. Putnam and her navigator, Captain Noonan, whose deaths must now be presumed. Their flight has proved nothing which was not already known; their deaths have brought grief to many relatives and friends; and the search for them has cost untold gold. No one is any the better off for the ill-fated flight, and many are very much worse off.

If *Flight* were asked if it would ban all flights in which there is an element of danger the answer would be an emphatic "No." But there are justifiable and unjustifiable risks. A risk the taking of which can benefit no one we regard as being in the former category. The crews of the *Caledonia* and Sikorsky Clipper are taking risks; but the flights are made with a definite object in view, they are not an end in themselves, and everything that human skill and ingenuity can do to reduce the risk has been done. That fact, in our opinion, places the risk in the justifiable category.

Passing of a Pioneer

TO the Wright Brothers, Wilbur and Orville, we owe our knowledge of how to fly. The 300 m.p.h. projectiles of to-day had their beginnings in the crude contraption of sticks and string with which the famous brothers proved the correctness of their theories more than thirty years ago. So, also, may it be said that to Guglielmo Marconi, whose death took place last Tuesday, we owe our knowledge, or at least the beginning of our knowledge, of how to fly safely in all sorts of weather. Without wireless, regular commercial aviation would be impossible, and without regularity aviation could never become commercial.

There have been many pioneers other than the brothers Wright, and there have been many contributions to the science of wireless from others than Marconi; but for all that these names will be for ever linked with the two great sciences which, joined together, spell modern fast transport. Let us, therefore, pay homage to a man who, by his early work, laid so many cornerstones to which others could add until the edifice acquired solidity and beauty of form.

Born at Bologna in 1874 of an Italian father and an Irish mother, it was very fitting that in his technical career Guglielmo Marconi should divide himself fairly evenly between Italy and Great Britain. His first patent was taken out in this country in June, 1896, shortly after his arrival in England, and by July of the next year he was able to form the Wireless Telegraph and Signal Co., Ltd., which changed its name in 1900 to Marconi's Wireless Telegraph Co., Ltd. By the time aviation had advanced far enough to make it possible for Louis Bleriot to fly across the Channel in 1909, it was possible to establish wireless stations on both sides of the Channel for reporting his movements, and during the next few years experimental transmission and reception on aircraft began to show the way to aircraft wireless as we know it to-day. That it has advanced so far is due in a very large measure to the *practical* early work of Marconi.

Gone West

FLIGHT desires to join its voice to the many which must already have congratulated Russian aviation in general and Gromov, Yumashev and Danilin in particular on their magnificent performance. To increase in one leap (literally) the world's long-distance record from about 5,600 miles to about 6,700 miles is a feat of which any nation might well be proud.

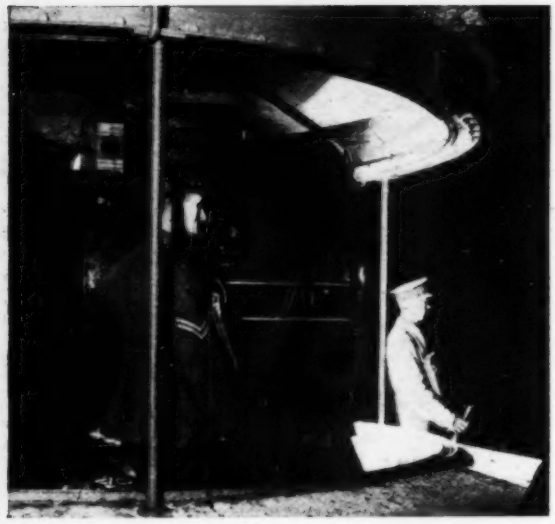
It is the fashion in some quarters to scoff at Russian aviation, and it may be that its general level is not up to that of some of the western nations. The record flight, however, has shown that when the Russians make up their minds to attempt some single outstanding feat, they have not only the will but the ability to succeed.

The A.N.T. monoplane used, similar to that exhibited at the Paris Show last November, was designed by Toupolev, who has thus added something to his already high reputation as a skilled and daring aircraft designer. The daring comes into the equation *via* the very large wing span used, which is so effective in keeping down induced drag, and the skill has been proved by the fact that in spite of its overloaded condition at the start of the flight the machine managed to stick together.

Facts and Logic

SOME reflections are aroused by an article in the July issue of *The Royal Air Force Quarterly*, in which a writer who signs himself E. L. H.-W. (the initials of Wing Commander E. L. Howard-Williams, M.C., *p.s.a.*) criticises General Golovine's book, *Air Defence*. The critic contests the General's statements that "Air raids alone, directed against objectives in the rear of the enemy battle line, cannot be relied upon to cause the collapse of a strong and sound State." The critic supports his view by saying that the collapse of Germany in the Great War came from within, not initially from the Army. "Create chaos within," he writes, "undermine the will of the people by gas and bomb and incendiary attack, and you may yet cause the kernel to go rotten, when the nut may fall from the tree. Air attack on the home town and propaganda can do what armies and navies may not be able to do."

Propaganda is mentioned as a kind of afterthought, but the passage suggests that the bombing of German towns was what caused the collapse of Germany. Few would uphold that suggestion. It is pertinent to ask: If the German Army had been clearly winning the war, would there have been any collapse inside Germany? Moreover, it is usually conceded that the pressure of the British Navy had a good deal to do with that collapse. To frame a good argument one must avoid what, if we remember right, is called in logic *suggestio falsi*.



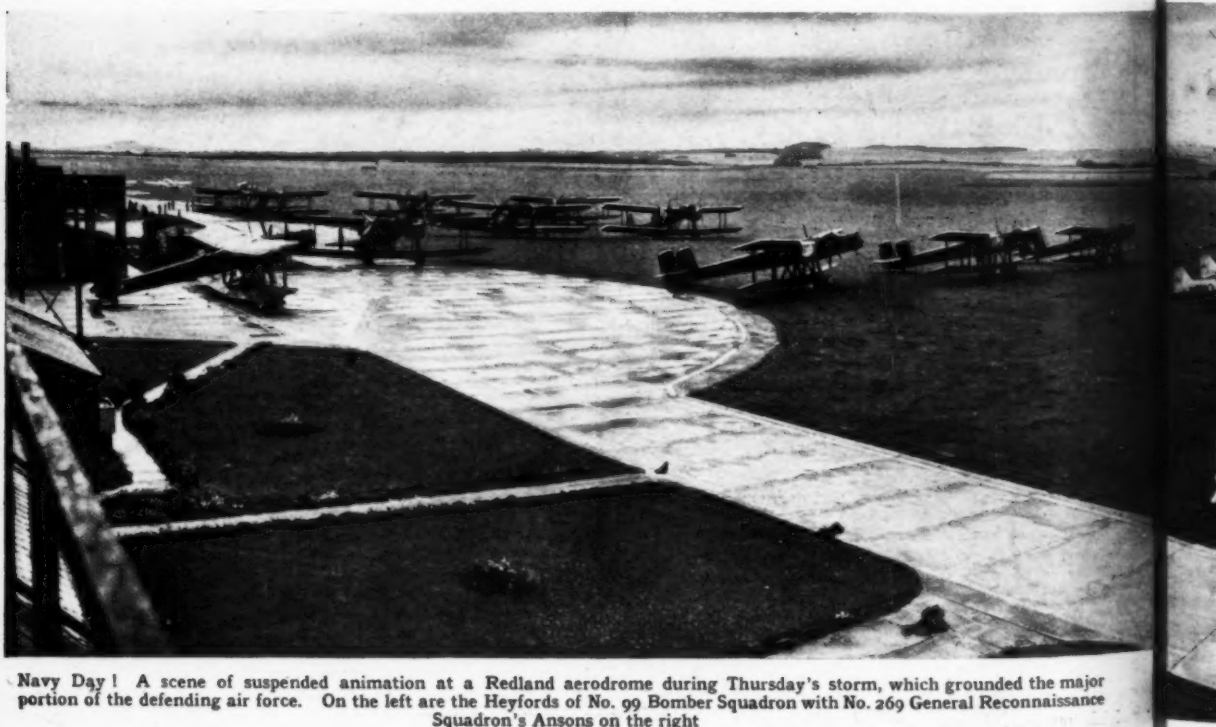
No concern with the upper air: one of the powerful searchlights of Redland's coastal defence forts. Its beam is confined to sweeping the sea. (*Flight* photograph.)

THE COAST DEFENCE EX

THE great war in the Channel has been fought out to its inevitable end, and Redland and Blueland are now busily licking their wounds, while the staffs and umpires of the Home Fleet, the Naval Command of Portsmouth, the Southern Command of the Army, and the Coastal Command of the Royal Air Force are estimating casualties and digesting the lessons.

At the same time the Territorial Army heavy gunners are full of satisfaction at having had real live naval cruisers and even battleships to fire at; the Post Office is patting itself on the back and having that same back patted by all three Services and by the special correspondents of all the great papers of the country for having faced a period of excessive strain and come out of it with flying colours; Trinity House is perhaps musing on how all its lights in the zone of war except five could be dispensed with, and were dispensed with, for three hectic hours in the middle of the night; and the Air Precautions Department of the Home Office is pondering a considerable number of problems which came to light (well, hardly to light; rather to pitchy darkness) during the great black-out on the night of Thursday-Friday.

It may well be that in some future war, if ever it should come, Great Britain will be better defended as a result of the lessons learnt during these exercises. What those lessons are the onlooker cannot know in any detail, but certainly this was the first occasion of any magnitude in which all three fighting Services had to work in the closest co-operation on a defence scheme. Redland's plan of defence had to be harmonious, as though controlled by one master mind, though actually it was managed by a triumvirate consisting of Admiral the Earl of Cork and Orrery, Commander-in-Chief, Portsmouth; General Sir John T. Burnett-Stuart, G.C.B., K.B.E., C.M.G., D.S.O., G.O.C.-in-C., Southern Command; and Air Marshal P. B. Joubert de la Ferté, A.O.C.-in-C., Coastal Command. Three brilliant brains: three strong personalities! One would very much have liked to hear all that went on inside their operations room. Anyway, the outward appearance was one of sweet accord. Whenever air reconnaissance was possible, and then, of course, it was the best form of reconnaissance, out went the flying boats to scour the seas. As



Navy Day! A scene of suspended animation at a Redland aerodrome during Thursday's storm, which grounded the major portion of the defending air force. On the left are the Heyfords of No. 99 Bomber Squadron with No. 269 General Reconnaissance Squadron's Ansons on the right

there were only twenty-four boats in all, and they could not cover all the western approaches to the Channel, naval vessels took over one area off the coast of France. When the weather blinded the eye in the air, the ships had entire charge of the problem of locating the enemy, working on the latest reports sent in by the air, which sometimes meant a half-told tale. It seems to have been really good co-operation.

As for striking power, the Red Navy had no striking force except its submarines, which were used very effectively. The most mobile striking force was three squadrons of Ansons (Nos. 206, 220 and 269 G.R. Squadrons), two torpedo-bomber squadrons (Nos. 22 and 42 from Donibristle), and the Heyfords of No. 99 (Bomber) Squadron. One flying boat tried to convert itself into a striking force, but did not live to reconnoitre another day. It may be noted that, with the exception of the Heyfords, all these squadrons had been trained in working over the sea and in the difficult task of ship recognition. The Ansons were used for striking and not for reconnaissance. Some day it will be very useful to train more bomber squadrons in work over the seas, but obviously when the main job in hand is to train three staffs to work together one wants to employ units which know how to set about carrying out their orders. One cannot profitably train units and Commanders-in-Chief at one and the same time.

In charge of Redland's defence (left to right): General Sir John Burnett-Stuart, G.O.C.-in-C., Southern Command; Admiral the Earl of Cork and Orrery, C.-in-C., Portsmouth, and Air Marshal P. B. Joubert de la Ferté, A.O.C-in-C., Coastal Command (*Flight* photograph.)

EXERCISES

How the Army, Navy and Air Force Worked Together : Portsmouth Heavily Bombarded : The Great Black-out

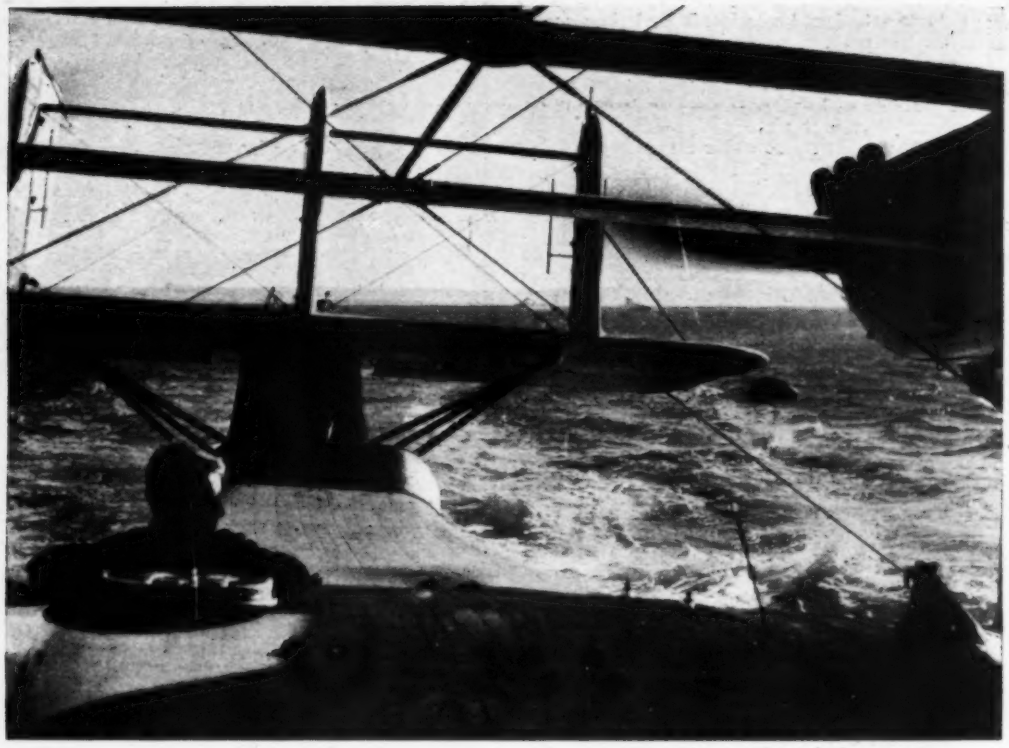
By MAJOR F. A. de V. ROBERTSON, V.D.

(Illustrated with "Flight" Photographs)

Here it may be as well to mention some minor instances in which co-operation between everybody did not seem quite perfect. The war started at 15.00 hours on the Wednesday, when the Blue Fleet was still many hours steaming away from the British shores and no aircraft from the Blue carriers were anywhere within flying range of Portsmouth. Yet about 15.15 some Red anti-aircraft gunners opened fire on single aircraft which they saw flying overhead. These gunners belonged to the regular Army. Now, this indicates (1) that the R.A. officer in command knew so little about the general idea of the exercises that he did not realise the impossibility of Blue aircraft having got to the Gosport peninsula by that time; (2) that he did not know that by day bombers do not usually fly singly over a fortress which is sure to be strongly defended; and (3) that he could not distinguish between different types of aircraft. It was almost certainly a Walrus or several Walruses in turn at which he fired, and, though the Blue cruisers and capital ships carried Walruses on their catapults, bombing raids would almost certainly be carried out by squadrons of Ospreys, Sharks or Swordfish, with Nimrods perhaps putting in an appearance. A knowledgeable man would have been up to all these points; and who ought to be knowledgeable about aircraft if not an officer of an anti-aircraft battery? I do not suppose the T.A. Archies would have been so out in their reckoning, but A.A. is A.A., whether its job is air defence of Great Britain or defence of the Army's lines of communication.

Wild Searchlights

My second criticism is that the work of the searchlights was too wild and undrilled. Both T.A. and regular searchlights were at work, and I could not say which were the wild ones; but when a bomber was caught by one beam a dozen or more would dash at it, some of them from long distances. Three beams ought to be enough. But on all air exercises I have noticed the same tendency of searchlights to cry "Me too," when someone else spots a bomber. Beams ought not to be exposed without good reason. These searchlights round Portsmouth also were inclined to try to expose aircraft flying with navigation lights on, which were most evidently Red fighters on patrol.



Looking aft from a Singapore III taxi-ing in from a patrol : an unusual impression by *Flight's* photographer during a trip in one of Redland's reconnaissance aircraft

In real war there may be a difficulty in distinguishing between friend and enemy at night, but there should be none on manœuvres.

One is sometimes inclined to wonder if the Committee of Imperial Defence realises that, while almost any branch of the fighting Services may be allowed to make some initial mistakes in a campaign, the one branch which must be keyed up to the *n*th from the very first moment is the anti-aircraft branch, both gunners and searchlight sappers. If they are not absolutely "slick" when the first raid comes over very grievous damage may be done.

Now for some account of the war. At 15.00 hours on the Wednesday it was known that the Blue Fleet was sailing from Port X for the western entrance to the Channel, and straightway out went the Red flying boats, No. 201 (F.B.) Squadron (Londons) from St. Mary's in the Scillies, No. 204 (Londons) from Mount Batten, No. 209 (Singapores) from Portland, and No. 210 (Singapores) from Pembroke Dock, to find them. In beautiful weather this was not very difficult, and within 25 minutes a Singapore had spotted a carrier (presently identified as *Courageous*) with five cruisers and four destroyers 30 miles S.W. of the Scilly Isles. The Singapore sent off its report, then tried to bomb *Courageous,* and was judged to be shot down. Before the outbreak of the war I had been told by a high R.A.F. officer that the flying boats would try to keep the enemy in sight without coming within fighting range; so I wonder what the A.O.C. had to say to the captain of that flying boat. Shortly afterwards another flying boat—I think a London from No. 201 (F.B.) Squadron, which was based at St. Mary's in the Scilly Isles, reported three cruisers and five destroyers 60 miles west of the Scillies.

It may be noted that the Blue Fleet contained seven cruisers (for the four battleships were reckoned in these exercises as eight-inch gun cruisers), but the boats had reported seeing eight. This shows the difficulty of ship recognition even by trained observers in very fine weather. *Furious* was not discovered until later in the evening, to the north-west of Land's End, and throughout the three days she hung about the entrance of the Bristol Channel and did not attempt to enter the English Channel.

On receipt of the reports, Air Marshal Joubert de la Ferté sent off the three squadrons of Ansons to attack the *Courageous,* and followed this up by sending No. 22 (T.B.) Squadron from Exeter to make a torpedo attack on the carrier and the five cruisers with her. The G.R. squadrons attacked with twelve Ansons each. It seems that *Courageous* survived, but soon after midnight she was seen twenty miles north of Guernsey by the Red submarine *Oberon,* which fired six torpedoes at her. Still she survived. Between 3.50 and 5 a.m. on Thursday Heyfords of No. 99 (B) Squadron at Boscombe Down went out to attack the same carrier—all apparently in vain.

Portsmouth Bombarded

At 5 a.m. on Thursday Blueland developed a heavy attack on Portsmouth. Cruisers and destroyers, the latter laying a smoke screen, made a determined attempt to force the eastern entrance of Spithead and severely mauled the local Red warships. *Rodney* joined in the bombardment, while *Courageous* lay off the south coast of the Isle of Wight and sent her Sharks to bomb both Portsmouth and Portland. *Furious* at the same time tried to attack Plymouth, but the bad weather which had been reported as coming in from the Atlantic had by then reached Plymouth, and the Blue aircraft were diverted to other targets. This attack on Portsmouth at dawn on the Thursday was the heaviest engagement of the war.

Then the bad weather took charge, and the Blue Fleet drew off to the south-west and vanished into the murk. Red aircraft did their best to find them, but the weather made it impossible. Several flights by Red squadrons had to turn back, some had difficulty in getting home, Exeter and Woodsford (near Dorchester) aerodromes were flooded

and out of action, and one Red Heyford was seriously damaged in a forced landing. The Red Navy had to carry on without air help, and its submarines were manœuvred so as to try to catch the Blue Fleet on its way out of the Channel. But Blue scored two quite dramatic little successes. Some Blue destroyers found the Red flying boat base in the Scillies and naturally played Old Harry with it and its wireless station. Then *Furious* came prominently into the picture. Four Londons of No. 204 (F.B.) Squadron were lying at their moorings at Mount Batten when suddenly seven Nimrods dived out of the clouds and made themselves as rude as possible for a few minutes. Scarcely had they disappeared when twelve Ospreys (presumably No. 801 F.F. Squadron) also appeared and really set about the unfortunate Londons. Three boats were judged to have been put out of action. These Ospreys had come in from the North, flying over the Cornwall-Devon peninsula to reach Plymouth. Despite the bad weather they all got back safe to *Furious*.

The rest of the fighting was sporadic, and the details were of little interest except to those engaged and to the staffs who have to study details and extract morals from them if they can. At 8 a.m. on Friday morning the exercises were brought to a close.

FROM A REDLAND FLYING BOAT

By J.Y.

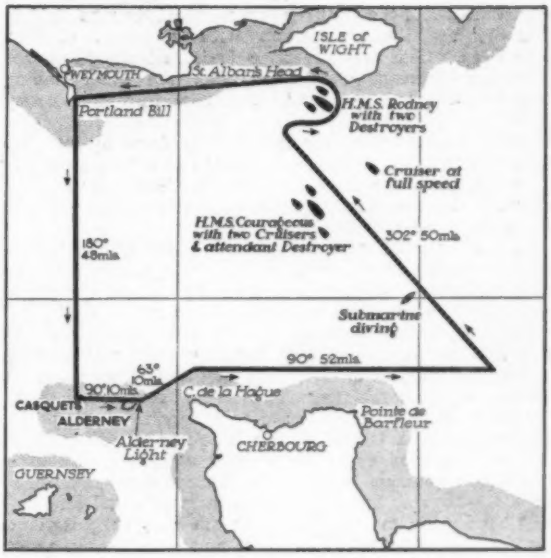
"SEARCH at dawn, as quickly as possible, the English Channel from Portland to 0° 30' west." In view of this signal passed from the Observations Room of Redland it was rather surprising that Coastal Area should order 85 knots at 2,000ft., for the Singapore IIIs of No. 209 (F.B.) Squadron are inclined to be rather soggy at this speed, which seemed inconsistent with the order "as quickly as possible."

However, as soon as the first streak of light appeared on the horizon a boat from the submarine mother ship *Titania* came alongside to take us off to flying boat Z. It was unfortunate that just as we approached on the starboard side the port rear Kestrel started and upset the coxswain's finesse somewhat. The bump, however, was taken on the foot rail, and no damage resulted.

While the engines were being warmed up, and while we waited for just sufficient light to see that the take-off path was clear, I looked over the Singapore's hull. Everything is very well found, and there is plenty of room to move about. On a cruise a crew of eight is carried, and the boat has to operate as an independent unit, the crew sleeping and feeding on board. Right at the rear of the hull is the gunner's cockpit, with a hemispherical field of fire to discourage any fighter who thinks flying boats are easy meat. Then, in the portion of the hull aft of the step there is provision for carrying all sorts of stores, including two spare props, one for the front and one for the rear engines, the shape being different owing to the fact that each pair of engines is in tandem. Moving forward, next comes the centre gunner's cockpit with a sea drogue tucked in at each side. In action one would hope to have a cool-headed gunner at this particular point, as the field is rather limited, and enthusiasm might be the cause of several punctures in the wing-tip floats and tail.

Forward of this position, on the port side is the fitter's workbench, while opposite, on the starboard side, is the kitchen, where tea was already being brewed—and very excellent tea it was, too, served in bakelite cups to save weight. Speaking of weight, the Singapore III weighs nearly 15 tons when fully loaded.

Now we come to the real "works" of the boat. On the port side is a very complete wireless panel where the operator can sit in comfort to do his job, while on the starboard side are the engine panels, one for starting and one bearing all the gauges showing temperatures and pressures, complete with levers for opening and closing the radiator shutters—looking for all the world like a toy signal box. I would have liked to have played with it, but the result might have been expensive.



The course taken during the flying-boat patrol described on this page by one who took part in it.

In the widest section of the hull comes the part which, on a cruise, becomes the ward-room, a table being fitted in the centre. When on service, however, a large chart table is rigged for the navigator to work upon, and on each side are large, square ports opened in flight for observation, taking bearings, and so forth. The pilots' cockpit comes next to this, dual control and an automatic pilot being fitted, while the extreme nose forms a gunner's cockpit with sliding Scarff ring and a chain locker with room for various other mooring gear.

* * *

The steely grey dawn had arrived, and we took off easily, the slight sea and moderate wind being ideal for the purpose, and our course was set due south for the Casquets. I was given the second pilot's seat, and observation on that side was my particular job in life. It was very impressive to watch the various types of shipping below as the sun slowly crept over the horizon in a blaze of gold. However, no enemy vessels were to be seen on this leg of the patrol, and we turned due east for a while and then north of east for ten miles to avoid flying over French territorial waters—it must be remembered that France was *really* neutral in this war. Next we went east again for another fifty-two miles. There was little to be seen on this run except merchantmen, and Singapore Z sailed along under the benign influence of George, the automatic pilot. To watch the controls move gently of their own accord put one in mind of a Wellsian fantasy, and this feeling was particularly striking during the frequent periods when Flt. Lt. Paddon left his seat to go aft.

Under Fire

Turning again on to a diagonal of our previous two bearings we soon found ourselves mixed up in the war. First a submarine dived about a mile and a half ahead of us and then H.M.S. *Courageous*, attended by one destroyer and two cruisers, appeared on the port bow, and although we were roughly in the sun from them it was not long before a dazzling searchlight was aimed at us to let us know we had been seen and were under fire. When we came in sight of the aircraft carrier we donned life jackets and parachute harness, for, as the pilot said, "you never know when some clumsy goof is going to knock your tail off."

Then I achieved a piece of spotting on my side. With binoculars I just discerned dim outlines of naval craft to

the N.N.E., and the pilot easily recognised them as H.M.S. *Rodney*, the enemy flagship with a screen of two destroyers. This was indeed a find, and the news was wirelessed—through one aerial wire, the other having broken some time previously and now trailing uselessly over the tail plane.

While we turned to shadow *Rodney* from up sun, we spotted an enemy cruiser at full speed in a north-westerly direction, making a tremendous wash. She was too busy to worry about us, as no searchlight was turned on—maybe she never even saw us.

It was the same with *Rodney*. It seems almost impossible that she did not spot us, for she appeared to be so close and clear. But, of course, we were in the eye of the sun and were doubtless very difficult to see.

Activity ceased as abruptly as it had started, for that was the end of the war so far as we were concerned, though we did see a formation of our striking force on its way out to bomb the targets we had reported.

And so back to breakfast after a very interesting trip. One must pay a tribute to the boat's crew. Everything had been carried out with a quiet efficiency. To have had a Pressman on board during serious work must have been a nuisance, but I was given a grandstand seat and had been made to feel almost like one of the regular crew by the time *Titania's* boat came alongside to take us on shore.

THE GREAT BLACK-OUT

By F.A. de V.R.

ON the night of Thursday-Friday, July 15-16, the Air Raid Precautions Department of the Home Office held its first large-scale practice. One ward in Portsmouth and two in Southampton were chosen for full-dress rehearsals, but the whole of the Hampshire coast and the Isle of Wight were voluntarily darkened between midnight and 3 p.m. Trinity House co-operated by extinguishing all except five of its lights round the entrance to these ports, and warnings were sent out to shipping that this would be done. The time for the practice was fixed, irrespective of what the Blue forces were doing at the time, but to give an air of reality to the proceedings No. 810 (T.S.R.) Squadron, flying Sharks, had been landed from its carrier so as to make night raids on the two towns without having to risk night landings on the deck. No. 74 (F) Squadron (Gauntlets) from Tangmere was the Red night-flying squadron, day defence work having been undertaken by No. 1 (F) Squadron (Furies). The Home Secretary, Sir Samuel Hoare, came down to watch.

I elected to visit Portsmouth, and at midnight officials of the A.R.P. Department conducted a party of privileged spectators, including many Chief Constables, from the Guildhall to the scenes of damage and tragedy. Actually six exercises, or tableaux as they were called, were carried through in Portsmouth that night, and others in Southampton, but in the time it was only possible to visit two.

The heavy rain of Thursday afternoon stopped about 10 p.m., and the low clouds gradually broke up and passed away, leaving a fine starlit night with a distinctly cool wind blowing. The drive through the streets of Portsmouth was extremely impressive. Having been severely raided and shelled that morning, the good people of the city were very air-raid-conscious, and practically all householders had darkened their houses completely. Only one shop, where there was a sale of ladies' underclothing on, had its electric lights in full blast. There was no traffic in the streets except our two omnibuses and a few cars of people connected with the exercises, and they were feeling their way along with only side-lights showing.

We came to Durban Road, a very quiet residential part with middle-class two-storey houses in rows on both sides. There a bomb was supposed to have fallen, and a section of wall and a lorry had been splashed with mustard gas. Actually, they were doped with Mixture Z, a very evil-smelling compound, which I was told would make me sick if I stayed near it very long. Three men were also casualties. At zero hour a "cannon cracker" was lighted on the pavement and went off with a loud bang. The bomb had fallen. Then there were calls for the Air Raid Warden and someone was sent off to telephone. Presently an ambulance appeared, and then another, and yet a third. Those three casualties must have been very well looked after. How the first-aid party could do it in the darkness, showing only now and again flashes from blue electric torches, I could not make out. All wore gas-proof clothing and masks, and evidently it is hard to hear spoken words when wearing a mask. The end of the street was roped off and marked as contaminated by gas. Presently the decontamination squad arrived in a municipal refuse van, which had been converted (as I understand that they can speedily be converted) for decontamination work. The masked robots unwound their hoses and played them on the wall and the lorry.

Then we went on to a piece of waste land near the Central Depot where the city engineer had built up an already bombed house with a crater in the "road" and a burst water main and sewage main. There were eleven dummies, representing casualties, in the upper storey of the house. This exercise required first-aid party, rescue party, road repair squad, sewage repair squad, and water repair squad. It was the most elaborate tableau. In the pitchy darkness which prevailed I do not see how they could all have carried out their tasks. Certainly the Home Secretary would have seen nothing. So a spot light from a lorry was played on the house and the squads did their work.

I was very impressed by the number of volunteers which Portsmouth could turn out for this exercise. It does the city great credit. My second reflection was that they all needed a great deal more practice, and no doubt they will get it. Obviously there was confusion and delay and the men were not smart in handling their ladders and stretchers. I think most of the casualties would have bled to death. Thirdly, it must be quite impossible to hide Portsmouth from enemy aircraft by turning out the lights. The coast line will always tell them where they are. The Sharks were all over us all the time, and battles went on overhead while the rescuers worked down below. Fourthly, incendiary bombs are sure to be dropped in a raid, and once fires are started would any harm be done by allowing the salvage people and first-aid parties some light to work by? This exercise taught the valuable lesson that a great deal of practice is necessary before all these squads can work with efficiency in very difficult conditions.

Lord Kenilworth Looks Back

QUITE soon after the war Sir John Siddeley (now Lord Kenilworth) offered to build the Air Ministry an aeroplane with a supercharged fourteen-cylinder radial engine, variable-pitch airscrew and steel fuselage construction. This was revealed at a London banquet given in his honour by the S.M.M.T. last Thursday. Telling his audience of this proposal, Lord Kenilworth said that the Air Ministry were pleased, but thought that the price was too high, whereupon he was able to point out to them that the figure he mentioned represented not one machine, but five.

Lord Kenilworth, recalling incidents in his fifty-six years of engineering, claimed that the "wet liner" for engine cylinders was among his innovations.

A Marconi Appointment

IN consequence of the appointment of Mr. L. A. Sweney as manager of the Aircraft Department of Marconi's Wireless Telegraph Co., Ltd. (in addition to his position as manager of the Marconi Aircraft Wireless Establishment at Hackbridge), the administration of the department will be at Hackbridge.

Joining Marconi's in January, 1936, Mr. Sweney has been manager of the Hackbridge establishment for the past six months. His experience with civil aviation dates from the days of Aircraft Transport and Travel, Ltd. For many years he figured as an able organiser in the Directorate of Signals (Civil Aviation) Air Ministry.

As manager of the Aircraft Department Mr. Sweney succeeds Mr. F. S. Mockford, now Marconi's deputy general manager.

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

MR. BURGIN, the Minister of Transport, surveyed some of England's trunk roads from an Imperial Airways D.H. 86 early this week.

The Air Ministry has denied a report that a non-stop flight to Australia by an R.A.F. bomber is contemplated.

Mr. David Llewellyn seems to have abandoned his attempt to beat the Cape-London record held by Mr. H. L. Brook.

Organised jointly by a salvage company and Danish Airlines, an ambulance service operated with three Fokker F.VIIs is now available at 76 stations in Denmark.

Norway has been puzzled by nocturnal visits of a large multi-engined machine, thought to be a new German Atlantic type under secret test—someone with an analytical ear has identified it as having Diesel engines.

Resembling a massive bunch of grapes, the latest balloon devised by Professor Jean Piccard (brother of the illustrious Auguste) has been destroyed in America by fire after an experimental flight.

It is reported from Vancouver, B.C., that Boeing Aircraft of Canada, Ltd., are to build eleven Blackburn Sharks under licence for the Royal Canadian Air Force. Representatives of the Company are at present in England.

At the annual general meeting of the Air League of the British Empire, the Duke of Sutherland announced that the Air League's gift to charity as a result of Empire Air Day amounted to £12,000.

It was also announced that grants from the Young Pilots' Fund have been made to young men learning to fly at clubs in Canada, Northern Rhodesia and Nyasaland.

SPEED WITH LOAD: Lt. Bruno Mussolini (right), second son of *Il Duce*, recently broke three international records with a Savoia-Marchetti S.79. They included 1,000 km. at 264.76 m.p.h. with a load of 2,000 km. He is seen with his co-pilot, Lt.-Col. Biseo.

FARTHEST YET: The three Russians who, as recorded on page 110, flew the ANT. 25 monoplane 6,650 miles, via the North Pole, from Moscow to California. They are, right to left (and to give them their full honours), Hero of the Soviet Union M.M. Gromov, Engineer of the Third Rank, S. A. Danilin, and Major A. B. Yumashev.

Lord Swinton, Secretary of State for Air, last week visited the Handley Page works and, conducted by Mr. F. Handley Page and Mr. J. Hamilton (works manager), saw Harrows in quantity production.

Aeroplanes equipped with flame-sprayers are being used by Government expeditions in a fight against locusts along the 30-mile front in the Western desert of Egypt, on the Libyan frontier.

The completion of Germany's new Zeppelin, L.Z.130, will be delayed until the spring of 1938 for reconstruction to use helium. The structure weight must be reduced by about 20 tons to make up for the loss of lift.

The amateur-built American Allenbaugh racing monoplane has a span of only 18ft., weighs 675lb. fully loaded, and does 200 m.p.h. with a 50 h.p. Hallman B engine, which employs major parts of the Ford Model A unit.

Denmark's air force is shortly to acquire twelve Mercury-engined Fokker D.XXIs, ten of which will be built under licence in the country. It is rumoured that difficulty in obtaining delivery from abroad is causing an aircraft-building reorganisation that will make Denmark independent.

The Grumman concern is building a batch of civil amphibian monoplanes, each fitted with two Wasp Juniors. Data are: top speed, 205 m.p.h. at 5,000ft.; weight empty, 5,320lb.; gross weight, 7,500lb.; range at 75 per cent. power, 795 miles.

It is said that sixty or more aerodromes are in course of construction in various parts of Italy.

A contract for 210 single-seater pursuit machines has been given by the U.S. Government to the Curtiss-Wright Corporation. They are 300 m.p.h. low-wing monoplanes with all wheels retractable.

Major Alexander P. de Seversky, President of the Seversky Aircraft Corporation, has composed a march, dedicated to U.S. Army, Navy and Marine pilots, and entitled "Over Land and Over Sea." The lyrics were written by Mrs. de Seversky. Major de Seversky's brother is not unknown on English wireless programmes as "The Singing Pilot."

Twenty-five Years Ago

(*From "Flight," July 20, 1912.*)

"Who will say that the Shop Act may not indirectly benefit aviation? It certainly should as regards Hendon, at any rate, for the Grahame-White Aviation Co., Ltd., have hit on the excellent idea of providing entertainment in the form of exhibition flights at the London Aerodrome every Thursday afternoon, for those members of the community that, by law, have their half-holiday on that afternoon. The first of these exhibitions took place on Thursday last and was a great success."

The End of the International Soaring Competitions : A Two-seater "Record"

There is something specially attractive about sailplanes on their native heath. On the left is a view of the line-up at the summit, while on the right is one of the King Kites with a background of Fulda Valley ; Mr. J. C. Neilan, one of the pilots of the machine, is second from the left in the group.

WASSERKUPPE FINIS

THE second and concluding week of the international soaring competitions at the Wasserkuppe has brought about a marked increase in the prestige of the British team. Nevertheless, though some excellent performances have been put up by our pilots, the weather throughout the meeting has never been really suitable for showing off the new King Kite sailplanes at their best.

For this purpose a high wind with well-developed "cloud streets" is needed; in such conditions, which are those in which the longest distance soaring flights in the world have been made, the machine which gets from end to end of each "street" in the shortest possible time is the one which can travel at the highest possible speed with the least possible detriment to its gliding angle. In this particular characteristic the King Kite is probably equal to the best of its rivals, and superior to most. But though, in ordinary "thermal" weather, it is thus able to dart quickly from one area of lift to another without losing much height, this advantage is offset by the longer time it takes to get up inside the thermals, owing to the fact that its high stalling speed prevents it from going round slowly in tight circles.

On Monday, July 12, pilots who got away eastwards found, on reaching Meiningen, that the clouds were down on the heights of the Thuringian forest. Few could surmount this obstacle, and those who did so probably worked across wind on a southerly course, since most of their landings were made towards the south-east. Hofmann, for instance, landed near Regensburg after a flight of 135 miles, while Sandmeier, of the Swiss team, made a flight of 122 miles which raised him to third place in the order of points so far gained. J. C. Neilan, in a King Kite, only got 25 miles, and most of the other flights were similarly short.

Tuesday proved a much better day, good distances being achieved, and three pilots had to come down in Czechoslovakia. Amongst these was Flt. Lt. P. M. Watt, who, after crossing the border, found himself passing over the town known to the Germans as Eger and to the Czechs as Cheb. He still had plenty of height, but thought it best to descend where there were good facilities for communication, especially as the town possessed an aerodrome. His retrieving team, with trailer, having got through the German frontier post at 3 a.m. next morning, found that the Czech frontier did not open till five, so they lay down for a two hours' nap in no man's land and, so they relate, were very nearly shot for their presumption.

The longest flight this day was one of 186 miles by Hofmann. Flt. Lt. Watt was seventh in order of distance with 111 miles. P. A. Wills and the Swiss pilot Baur both landed on Bayreuth aerodrome, 82 miles away, within a few minutes of each other, while Mrs. Price flew a King Kite 57 miles and landed at a tiny Bavarian village called Schwürbitz, whose inhabitants had never seen a foreigner before. They were most charming to

The three lady competitors—from left to right, Emi von Roretz (Austria), Hanna Reitsch (Germany) and Mrs. Price (formerly Joan Meakin).

her; the men of the village dismantled the machine, Mrs. Price was given a tremendous meal in the village inn, and then a dance was held there in her honour, to the accompaniment of an accordian, while an English-speaking youth from the next village was fetched in to act as interpreter.

On Wednesday, the 14th, J. C. Neilan, in a King Kite, was seen to get into a spin and get out of it again within a few hundred feet of the ground, and then proceeded to show how little such trifles worried the British team by going on a distance flight of 35 miles. Conditions were not very good, and all distances achieved that day were between 20 and 60 miles, except for one of 108 miles by Hofmann.

Thursday brought only a light wind and very sparse thermals, and, although a " cold front " was expected, it failed to arrive till after sunset.

Friday brought some good distance flights, the best being a flight by the Polish pilot Baranowski of 187 miles to Ketzin, near Potsdam. He was apparently trying for the prize of R.M. 3,000 offered some time ago by a Berlin newspaper for the first soaring flight from the Wasserkuppe to Berlin, but there is some doubt whether it is available to a foreigner. Another Polish pilot, Zabski, achieved a climb of 2,816 metres (9,298 feet), the highest of the meeting. Of British pilots, Mr. Watt went 96 miles and Mr. Neilan 46 miles, but Mr. Wills, after reaching the next west-facing slope and soaring over it for two hours while he watched others go by overhead, was unable to pick up any thermals at that low height.

The last day of the main competitions, Saturday, July 17, was not an easy day for distance flights, and only two pilots achieved over a hundred miles, Sandmeier, of Switzerland, and Hanna Reitsch, of Germany. Mr. Wills went 38 miles and Mrs. Price a shorter distance.

So much for cross-country work; but in the second week there has also been some excitement in the realm of duration flying.

Accidental Record

The Falcon III two-seater distinguished itself on Monday, July 12, by unwittingly setting up a new international record. There being rather a boisterous west wind that day, it was decided to ballast the machine by putting both pilots in together. The Falcon is regarded as the joke of the meeting; the Swiss refer to it as the " flying bath-tub," while to the more romantic Germans it is known as the " honeymoon sailplane " (it has side-by-side seating). So when, just before 11 o'clock, the machine took off with Mr. J. S. Fox at the controls and Flt. Lt. W. B. Murray turning round to wave farewell to the crowds, there arose the biggest roar of laughter that the Wasserkuppe has heard for many years.

The competition rules require that duration flights, when they have lasted an hour, must be continued at some other place at least 5 kilometres from the Wasserkuppe summit, so before long the Falcon moved off to a long west-facing slope about four miles downwind, over which it remained for the rest of the day, the two pilots taking turns at the controls. A landing had to be made when darkness set in, by which time the flight had lasted 9 hr. 48 min. It so happens that, among the new international records which the F.A.I. decided last January to recognise, is one for longest duration by a sailplane with two occupants, and, although longer flights in two-seaters have been made in the past, this will be the first such record to be officially recognised!

Having put up this splendid achievement, Mr. Fox and Mr. Murray decided that the next thing to do was to better it. Consequently next morning, soon after sunrise, their team was routed out of bed, the *Sportleitung* was awakened and requested to blow the official starting hooter, and the Falcon got into the air again at 6.30 a.m. But alas! the wind proved insufficient to keep both pilots up together.

Apart from this international record, the Falcon was in the running for one of the chief prizes of the competitions, the prize for greatest total duration. This is reckoned by a system of allotting points, in such a way that no points are earned for the first 2½ hours of a flight, after which the number of points mounts up at an increasing rate the longer the flight proceeds. The Falcon's chief rival for this prize was an Austrian single-seater machine, flown in turn by Frl. von Roretz and Herr Frena. After the " record " flight the position was: Austrian machine, 261.8 points; Falcon, 217.25 points. Afterwards Herr Frena made a flight of 2 hr. 37 min., adding another 1.1 points to his total.

As an example of the large amount of soaring which goes on in Germany at the present time, an incident which occurred during a flight by Mr. Fox in the Falcon on Friday, July 16, is worth mentioning. A Rhönsperber sailplane—not one of the competitors—appeared out of the blue and gate-crashed into a thermal current in which Mr. Fox was circling; it stayed in the thermal until it had gained enough height to make a landing on the aerodrome near the summit. It turned out to be one of three machines making a " goal flight " to the Wasserkuppe from the aeroplane-towing school at Darmstadt; a second machine arrived shortly afterwards, while the third was found in the evening on one of the lower slopes.

There had been a similar occurrence a few days before, when a woman pilot landed a sailplane on the Wasserkuppe aerodrome and announced that she had just come from the Hornberg gliding school near Stuttgart, 125 miles to the south. She was merely making the qualifying distance flight for her " Silver C " certificate.

The Winners

The prize distribution on Sunday evening, July 18, was preceded by a ceremony at the German aviators' war memorial, a bronze eagle perched on a rocky knoll just below the mountain top. The team leaders of each nation represented in the competitions—Britain, Jugoslavia, Austria, Poland, Switzerland, Czechoslovakia and Germany—each laid a wreath at the foot of the memorial on behalf of their teams, Professor D. Brunt performing this service for the British team.

The prizes were then announced by the President of the Aero Club of Germany, Wolfgang von Gronau, and subsequently distributed by him at a dinner to which everyone connected with the competitions was invited—about 600 persons in all.

The winner of the chief prize of R.M. 2,500 was Heini Dittmar, of Germany, formerly the holder of three world's gliding records. He also won a prize offered by the German Chancellor. His score was 1,662.5 points.

The next four in order of total points gained also received money prizes. They were: Ludwig Hofmann, with 1,427 points; Wolfgang Späte, 1,325 points (both Germans); the Swiss pilot Sandmeier with 1,127, and the German Kurt Schmidt with 1,116 points; Fräulein Hanna Reitsch, in the sixth place with 1,104 points, received a prize from the German aviation industry.

Actually the points were awarded to machines, not to pilots, and the twelfth place in the list was taken by the King Kite flown by Flt. Lt. P. M. Watt, with Mr. D. G. Hiscox as relief pilot. It earned 440.5 points, a figure which was exceeded by three Polish machines, one Swiss and one Austrian, in addition to those already mentioned. The Hjordis, which was flown entirely by Mr. P. A. Wills, achieved 14th place with 270.5 points; the two-seater Falcon III earned 217.25 points, and the other King Kite, flown in turn by Mr. J. C. Neilan and Mrs. Ronald Price, 127.5 points. There were 28 machines entered for the competitions, of which 22 earned points.

The other chief prizes, of R.M. 1,000 each, were awarded for the longest distance flight, the greatest absolute height, and the greatest aggregate duration measured in points.

Some Comparisons

The distance prize had to be divided among the German pilots Dittmar and Frl Reitsch and the Polish pilot Mynarski, all of whom reached the Fühlsbüttel aerodrome at Hamburg on the first day of the meeting. The height prize was won by Zabski, of Poland, with a climb of 9,298 ft. on the last day but one. It is of interest that Flt. Lt. Watt achieved the second best climb, one of 7,644 ft.

The duration prize went to the Austrian machine, of Rhönsperber type, in which Herr Frena put up a total duration of 19 hours 1 minute.

Comparing the various national teams, it may be said that, next to the Germans, the Polish team showed the greatest all-round ability; the Swiss had a pilot of exceptional skill in Herr Sandmeier; while the British pilots showed themselves on the whole better at cross-country flying than the Austrians. Only one of the four Czechoslovak machines earned points, while the Jugoslav machine, which only arrived half way through the meeting, earned none.

The kindness and hospitality of our German hosts has been overwhelming. Everything possible has been done to help the visiting teams in any difficulties they may encounter. To take a single instance, one of the King Kites, in an effort to avoid some trees after a poor launch, broke its fuselage clean in half and suffered other damage; yet, by staying up half the night and continuing the work all next day, the staff of the repair workshop had the machine ready to fly again by the following morning. And they absolutely refused to take one pfennig.

The British team has had a wonderful time, and there is universal regret that the meeting is over. A. E. S.

TOWARDS THERMOPLASTICS

An Interesting Form of Wing Construction

THAT synthetic resins in some form or other are likely to play a large and increasing part in aircraft construction is a view now held by many. Hitherto the low value of Young's modulus has been one of the main objections, but the synthetic materials are being improved, and suitable forms of reinforcement may do the rest. By their imperviousness to wind and water, oil, grease, petrol and acids, these materials present a great many advantages, not to mention the ease with which they can be produced in the form of pressings. Thus, when the demand becomes large enough, there is little doubt that plastics will come into their own.

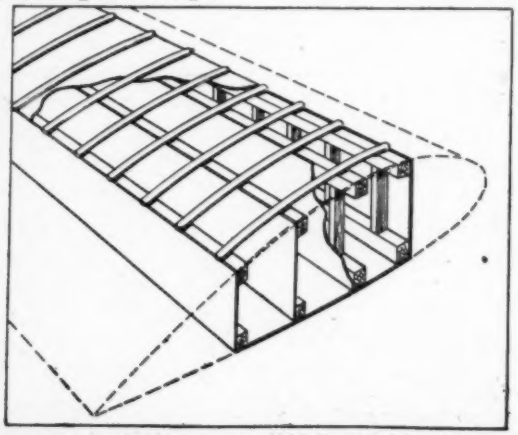
One of the difficulties of making use of plastics at present is that, the material itself being inert, it is difficult to find a cement for joining two pieces together. A great deal of progress in this direction has been made, and the end is not in sight yet. On the other hand, if the aircraft structure could be so designed that it did not need any cement, an important step would obviously have been made. It is from this latter angle that Deekay Aircraft Corporation, Ltd., of Broxbourne Aerodrome, Nazeing, Herts, has recently approached the subject of aircraft construction in plastics.

Trying it in Wood

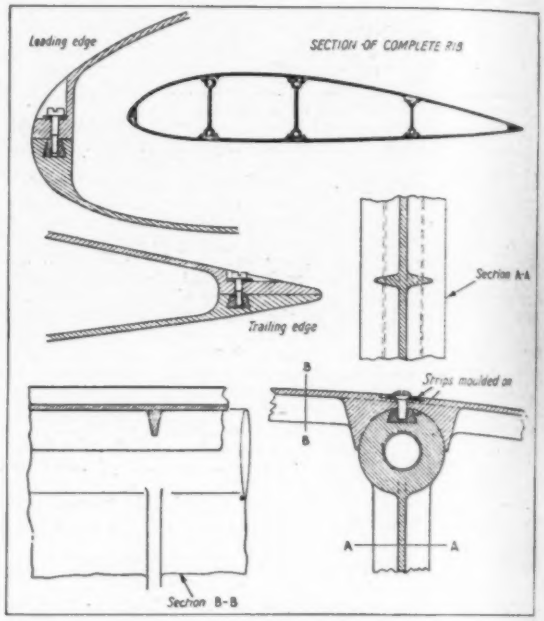
Before producing a wing in one of the synthetic materials now available, the chief designer of Deekay, Mr. S. C. Hart-Still, designed a wooden wing which is now being fitted on a small aeroplane nearing completion. A test wing was sent to the R.A.E., Farnborough, and the test results were very good. Based on an aircraft gross weight of 1,000 lb., the wing had as aspect ratio of 7 and weighed 1½ lb. per sq. ft. The load factor demanded (C.P.F.) was 9 and the wing root fittings failed at a load factor of 12.35. Even so, the wing itself was undamaged, and returned to its original shape without any permanent set.

The wooden wing is of extremely simple construction, having four main spars, three-ply covering, and but half a dozen ribs in the ordinary sense of the word. The four main spars are simply channels, with spruce flanges and single three-ply webs. With the plywood covering they form a very strong and robust "box," the leading and trailing edge portions being added afterwards as separate units.

In place of the usual wing ribs, the Deekay wing has external strips screwed and glued on top of the three-ply wing covering. A very small increase in drag may conceivably result from these strips, which lie in the direction of flight, and are not, therefore, quite parallel to the airflow, which is divergent underneath and convergent on top; but in any case, the effect, with the strips spaced a foot or so apart, cannot be as great as, for instance, the corrugations on a Junkers wing. Structurally, the Deekay scheme is certainly extremely simple, and the Farnborough test results show that it is strong for its weight.



The Deekay Aircraft wooden wing has four main spars, plywood covering and external battens in place of ordinary ribs.



How the wooden wing may be "translated" into plastic construction. The three spars have their booms reinforced with metal tube liners, and the skin is attached to the spars via moulded-in metal strips and screws.

The "translation" of this Deekay wooden wing into plastics is interesting. It is proposed to use three instead of four main spars, joints being made on the centre line of the fuselage as in the wooden wing. Use is made of a bulbous section for the spars, a form which has several advantages. As it is intended to reinforce the plastic material internally with a metal tube, the circular cross section of the spar flanges fits in well with the scheme. The reinforcing metal tubes will be moulded into the spar flange when the spar is being manufactured, and it is thought that the shrinkage which occurs will be sufficient to grip the metal tube and prevent it from sliding along inside the spar material. Should this be found not to be the case, some form of "roughening" may have to be adopted.

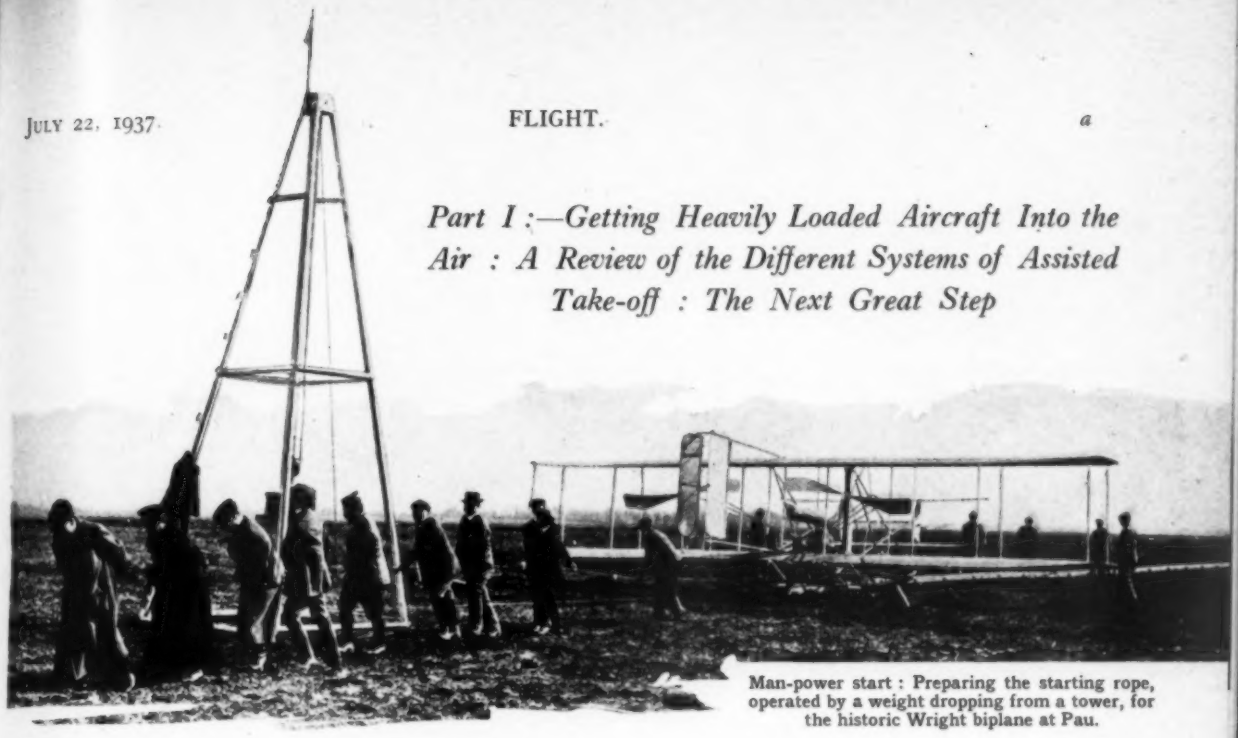
Stiffening ridges of the spar web are formed integral with the spar during the process of moulding, and they will, of course, be spaced in accordance with the loads to be supported. The intention is to make the spars in fairly short lengths, some 10ft. or so, in order to avoid the cost of very large dies and presses. The joints between adjacent spar lengths will be by bolting through the metal liners, and possibly through reinforcing sleeves or plates. A similar type of joint will, of course, be used on the centre line, where the port and starboard spar roots meet.

Another advantage of the bulbous spar booms is that "handing" and bevelling of the surfaces which receive the wing covering is avoided. The covering, also of plastic material, will be made up in standard size panels, with chordwise ridges moulded on the inside and large span-wise ridges for attaching them to the spar booms. Metal strips will be moulded into the spar booms, as shown in the drawings, and the covering panels attached to the spar booms by screws. Should a wing covering panel be damaged, a standard spare panel can be substituted in a few minutes.

Leading and trailing edges will be of the same general construction as that employed in the spar box, with bolted joints to secure top and bottom surfaces together.

The Deekay Aircraft scheme is an interesting one, and we gather that Mr. J. McEwan King, who is the moving spirit in the concern, is now looking for finance to make the necessary experiments and development possible.

Part I :—Getting Heavily Loaded Aircraft Into the Air : A Review of the Different Systems of Assisted Take-off : The Next Great Step



Man-power start : Preparing the starting rope, operated by a weight dropping from a tower, for the historic Wright biplane at Pau.

ASSISTING the TAKE-OFF

PROBABLY Henson should be regarded as the originator of catapult launching. He is reported to have used this method in an attempt to launch his glider as early as 1842. The Wright brothers, from 1903 onwards, launched their earliest aeroplanes with the aid of a single rail and a heavy weight hoisted to the top of a tower, as shown in the heading picture.

In modern times the assistance of some power supply extraneous to the aircraft is in regular use in the Royal Navy where a run sufficiently long to enable aircraft to take off under their own power cannot be provided. This takes the form of a catapult in which a cordite charge is exploded inside a cylinder, the pressure so generated being used to propel a powerful ram which is coupled with the launching carriage on which the aircraft rests. On land, catapult launching has not yet come into general use as it is nearly always possible to provide an aerodrome with a clear run long enough to permit the aeroplane to get flying speed under its own power. Experimental catapults have, however, been made and used, notably by the Royal Aircraft Establishment, Farnborough, for launching heavy bombers.

Advantages of High Wing Loading

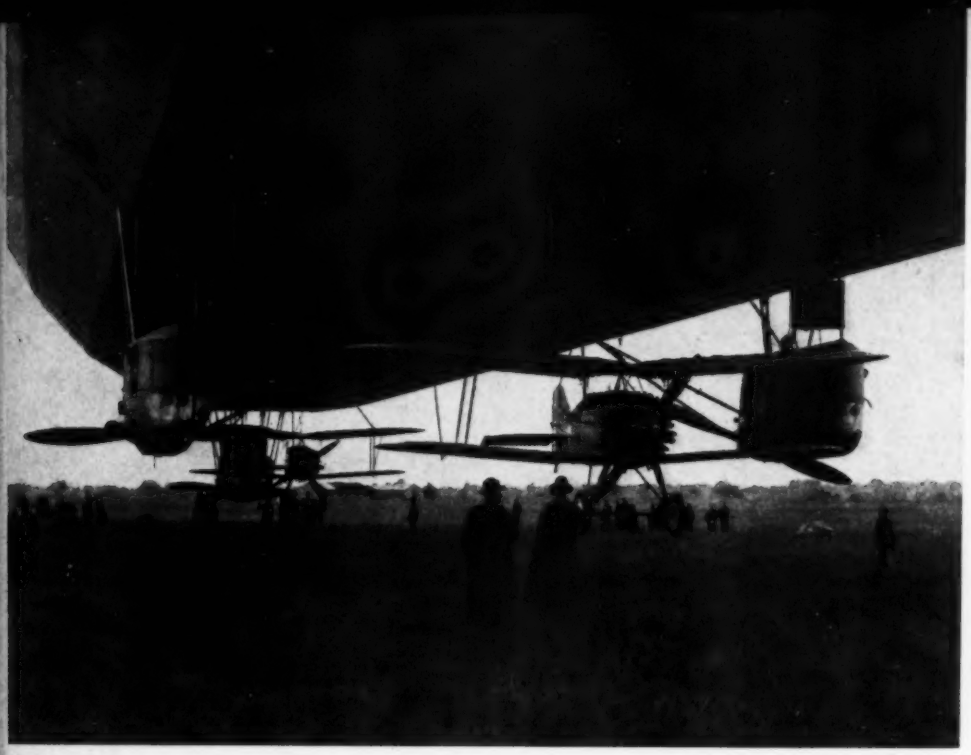
The modern tendency in aircraft design is towards higher and higher wing loadings in order to obtain higher cruising speeds. If, however, wing loadings are to be used so high that they can materially increase the aircraft's speed the problem of taking off becomes really serious, and when wing loadings of 45-50 lb./sq. ft. of wing area are contemplated some source of power not carried on board the aircraft becomes essential. In his admirable lecture to the Royal Aeronautical Society Mr. Arthur Gouge, chief designer and general manager of Short Brothers, gave a graph which illustrated the increase in cruising speed which could be expected to attend an increase in wing loading. For a power loading of 20 lb./h.p. the cruising speed rose from 160 m.p.h. at about 24 lb./sq. ft. to 190 m.p.h. at 47 lb./sq. ft. Obviously this gain could, on a commercial air route, be used either to shorten the journey time, to increase the pay-load, or to lengthen the stages flown without intermediate landings, depending upon the character of the route operated. However the gain was used, it would produce in one step a greater improvement than could any other single factor foreseen at present.

The two considerations which limit the wing loading are the take-off and the landing. The former can, as already explained, be overcome by supplying, for the take-off, power from an extraneous source. For the latter no remedy is at present in sight, although high-lift devices such as flaps and slots help very materially in reducing the landing speed for a given wing loading. That being so, it will be obvious that even if some form of assisted take-off is used in conjunction with a great increase in wing loading the scheme cannot be of general application, but must be confined to operations in which the "live" load is appreciably reduced during the flight. In the commercial world this means a long-distance air route, such as that across the Atlantic, on which the fuel consumed during the journey will reduce the wing loading of the machine at the end of the flight to something like 60 per cent. of its value at the start. In military aviation the application will be mostly to long-range bombers; in this case not only is the fuel consumed during the flight, but the bombs will presumedly have been dropped before the machine has to land again.

There are those who hold, including Mr. Gouge, that for the very large flying boats of the future it may be possible to use wing loadings of 40-50 lb./sq. ft., the large size of the machine making high take-off speeds possible. For landplanes, however, and for the flying boats of present-day size, take-off speeds of 100 m.p.h. or more and take-off runs of 1½-2 miles cannot be seriously contemplated, and the question therefore arises what form the outside power supply should take.

Early Beginnings

The Wright brothers, in 1908 or so, used the cheapest and simplest possible form, i.e., a dropping weight. Actually it can be said that they used man power, for the weight was hauled to the top of its tower by manual labour. The Wrights, however, were concerned with what would be regarded as a light 'plane nowadays, namely, a machine carrying pilot only and powered with a small four-cylinder engine of about 30 h.p. In modern times we are not greatly concerned with aircraft of less than 30,000 lb. gross weight, and we should now be planning ways of getting machines of 50,000 lb. gross weight or more into the air.



Lighter-than-air starting: Two Gloster Grebes suspended under the keel of R33 preparatory to being dropped from the airship in flight. (*Flight* photograph.)

Three distinct systems are worthy of consideration when it comes to examining the possibilities of assisted take-offs. The catapult has the advantage that it is already in use, the problems connected with it are well understood, and its limitations are fairly clear. The other two can really be said to be variations of the same fundamental idea: The lifting into the air of the aircraft to be assisted, by another aircraft, which can be either of the lighter-than-air or of the heavier-than-air type.

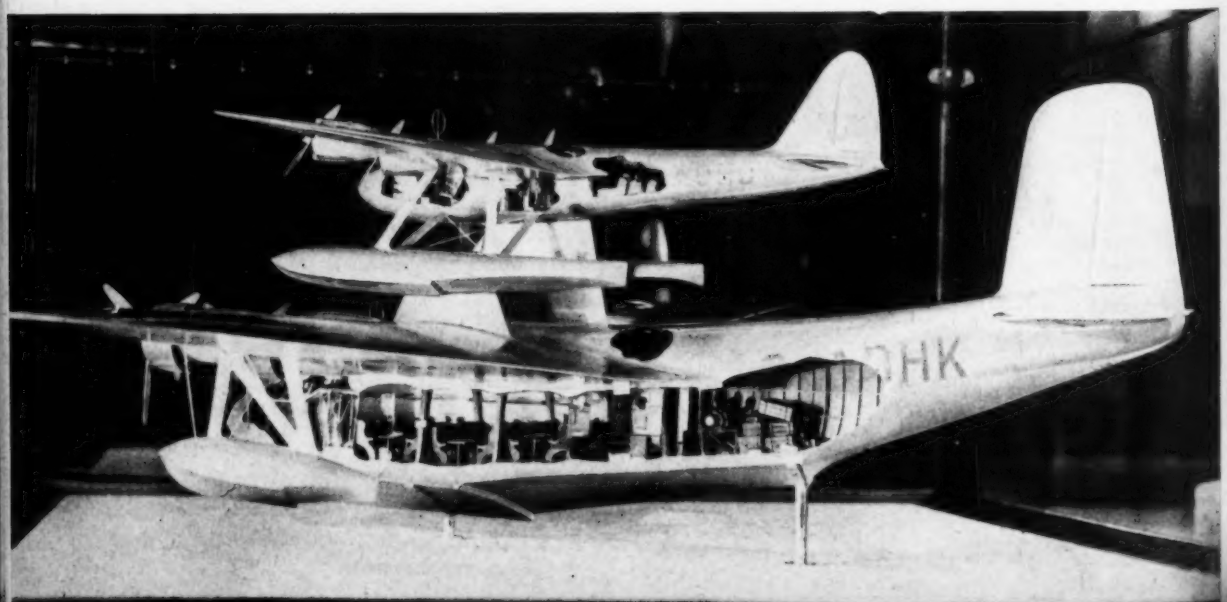
Many years ago Great Britain took the lead in experimenting with dropping aeroplanes from rigid airships. The airship used for the experiments was the old R33, and the first machine to be dropped was a tiny De Havilland D.H.53 single-seater light plane. The pilot was the late Sqn. Ldr. Rollo de Haga Haig, and the first experiment was quite successful. Later, as depicted on this page, equally successful experiments were made with two Gloster Grebe single-seater fighters. The object of these experiments was, of course, quite different from the modern conception of assisted take-off, and aimed at the airship carrying the two military aeroplanes about with her so that if she should be attacked she could release them so that they might chase the attackers.

It is scarcely conceivable that very large aircraft could be dropped from an airship or from a very large kite balloon. Apart from such obvious objections as the size of lighter-than-air craft needed, there is the difficulty arising from the fact that the speed at the moment of launching is low or nil, so that the dropped aircraft would fall a long way before gathering enough speed to become air-borne and under full control.

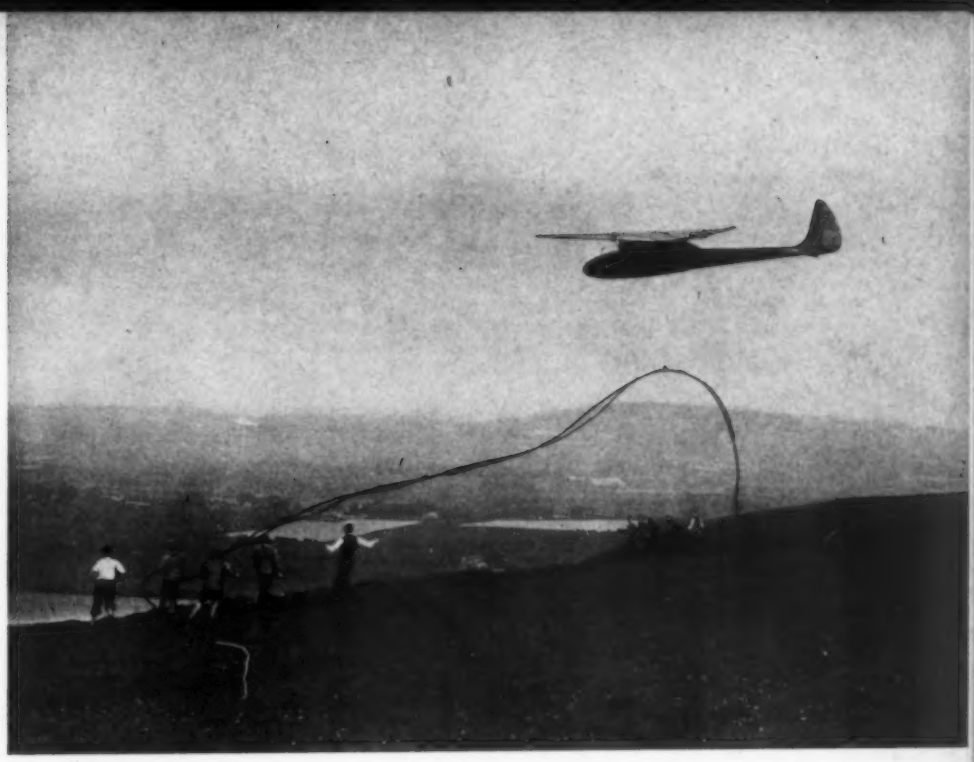
More promising is the so-called "Composite" aircraft invented by Major R. H. Mayo and jointly designed by him and Short Brothers, who have the two components of the first experimental machine nearing completion at the works at Rochester. Fundamentally, the Short-Mayo composite aircraft consists of a large and fairly lightly loaded lower component, which carries on its back a much smaller and much more heavily loaded upper component. The combined wing loading and power loading of the two aircraft regarded as one unit are fairly moderate, so that, theoretically, there should be no difficulty in taking the double unit off and climbing with it to the height at which it is desired to release the upper component.

The Crucial Moment

From a practical point of view, however, there are obviously a great many problems to be solved. The most difficult of these, because at present the least known, is the behaviour of the composite aircraft at the moment of separating. Fundamentally, the idea is that the angles of incidence of upper and lower component should be different, that of the upper component being, of course, the greater. If the wing sections are suitably chosen it is theoretically possible so to arrange matters that at a given speed (which is, of course, the same for the two components at that moment) the incidence of the upper component is sufficient to give its wing a lift slightly in excess of the weight, while the lower component is only



Heavier-than-air starting: A sectioned model of the Short-Mayo composite aircraft.



Another form of man-power starting in wide use for sailplanes : Catapulting with the aid of rubber cords. (*Flight* photograph.)

just carrying its own weight, or barely that. Thus, when the connecting mechanism is released the upper component will climb slightly and the lower component will sink slightly, the two pilots assisting by suitable manœuvring as soon as the two aircraft are clear of one another.

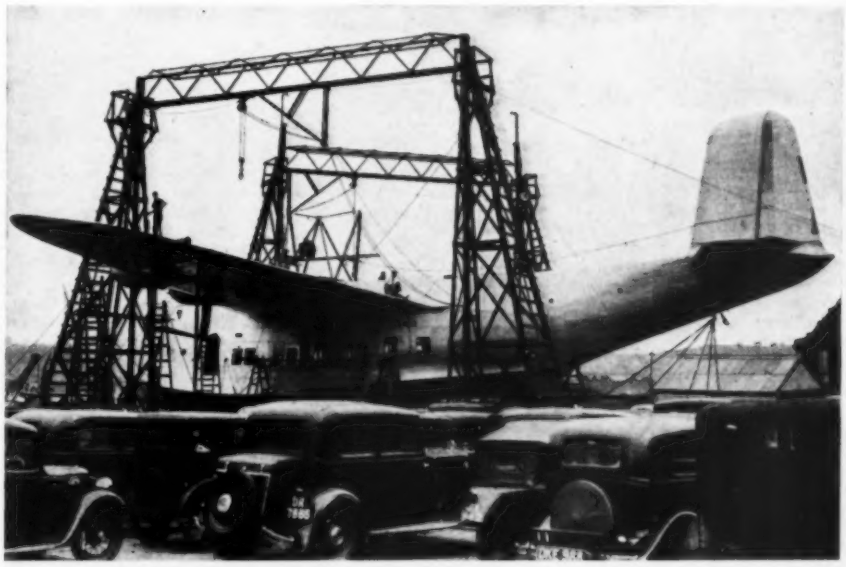
It will readily be appreciated that very good team work between the two pilots is essential if the separation is to take place without incidents. They will be in telephonic communication with one another, and during the actual take-off and climb the flying controls of the upper component will be locked in a neutral position, the handling of the machine being done entirely by the pilot of the lower component.

When the height at which it is desired to separate has been reached, the flying control surfaces of the upper component are released and each of the two pilots releases his part of the connecting mechanism, leaving the upper component free to detach itself automatically as soon as the necessary lift has been reached. The scheme is extremely daring in its conception, but the fact that it is being carried out by a firm of the long standing and excellent reputation of Short Bros. is a guarantee that it is at least worth trying.

Improved mobility as compared with catapult launching is one of the advantages claimed for the composite aircraft scheme. Superficially, this claim is incontrovertible, since obviously the two machines can be flown to any convenient site and the long-range upper component placed in position, fuel taken on board and a start made. When, however, one comes to consider the details the matter is not quite so simple. Obviously, a fairly heavy crane is necessary for lifting the upper component on to the back of the lower, and therefore the presence of such a crane must be presupposed. In addition, it is necessary to use a stretch of water in which there is little or no swell, otherwise there is a considerable risk of the lower component rising on a wave at the moment when the upper component is about to be made fast to it. This would almost certainly result in damage to one or both aircraft.

The alternative would seem to be to lift the upper component on to the lower while both are ashore. However, that would tend to increase the difficulties of getting the composite machine down a slipway and into the water In either case fuelling would, of course, be done after the upper component was in place.

The first Short-Mayo composite aircraft has been criticised on the score that the cruising speed expected from the upper component is only about 160-170 m.p.h. It has been argued that it seems scarcely worth while to go to all the trouble of a composite aircraft for the sake of such a relatively low cruising speed. In all fairness it should be pointed out that the first machine is purely experimental and that the main idea was to try out the feasibility of the scheme. Also Imperial Airways wished to make the upper component a twin-float seaplane in order that it might be tried out on the southern route via the Azores and Bermuda where no aerodromes are available and where, therefore, the ability to alight on the sea was essential. It goes without saying that a landplane of similar general design and with retractable undercarriage instead of the two floats would be very much faster, and, except for operational considerations, there is no reason why the upper component should not be a landplane. Neither is there, fundamentally, any reason why the lower component should not be a landplane, except the need for a fairly large aerodrome with very clear surroundings so



The lower component of the Short-Mayo composite aircraft being erected in the open at Rochester.

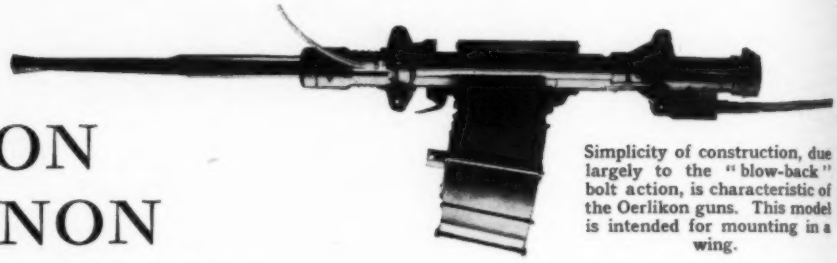
that there should be no fear of hitting obstacles during the first few trial take-offs. Another consideration in favour of making the lower component a seaplane was that the total loaded weight of the two components is considerable and there is always the problem of providing a surface sufficiently hard to prevent the wheels of the lower component from sinking in. In dry weather this might not be very difficult but, should there be a period of continued rains, it would be difficult to find an aerodrome sufficiently firm, as none of the British aerodromes has concrete runways. All these considerations influenced the ultimate decision to make the first composite seaplanes.

Incidentally, it may be mentioned here that the lower component of the Short-Mayo composite is just about to be tested, and it is expected that the upper component will be ready for flying tests in about a week's time. The lower component is so much like the Empire boats that no great amount of testing should be necessary, the main changes being that the hull has a wider beam over the chines, a greater wing area, and the engines placed farther outboard in order to enable the airscrews to clear the floats of the upper component. The upper component is, of course, an entirely new type, and will therefore have to undergo extensive tests for its C. of A. before the work of testing the two as a unit can be begun. Hence, it is likely to be some time before the great experiment of taking the two machines to 10,000ft. and separating can be undertaken.

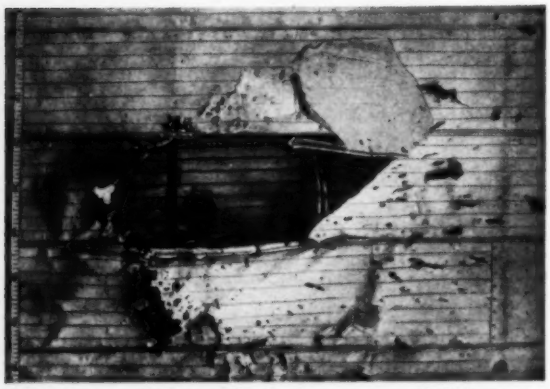
(To be concluded next week.)

THE OERLIKON CANNON

Facts and Data on a Widely Adopted Range of Shell-firing Guns



Simplicity of construction, due largely to the "blow-back" bolt action, is characteristic of the Oerlikon guns. This model is intended for mounting in a wing.



A hit on a metal-covered wing by a 20 *mm* shell from an Oerlikon gun.

WITH the introduction, towards the end of the war, of the German Becker 20 *mm* aircraft gun firing explosive bullets, an entirely new form of armament had to be considered. The cessation of hostilities brought a pause in the development of such weapons until the Swiss Oerlikon Machine Tool Co. revived them.

A salient feature of the Oerlikon automatic gun, which is being fitted into a number of Continental military aircraft, is the bolt, which is of the non-locking type, the requisite support to the base of the shell being offered by the heavy mass of the bolt itself. Thus there is no movable barrel and no separate locking lever. In the very last phase of its forward travel the bolt fires the cartridge so that its kinetic energy has first to be absorbed by the explosion before a rearward acceleration is imparted by the remaining force of the explosion. The bolt recedes and compresses its spring, which, as soon as it has absorbed the recoil, returns the bolt to its forward position. Thus the bolt and its return spring constitute the whole automatic repeating mechanism. It is claimed that this arrangement is very desirable for use in aircraft because it lays the minimum of stresses on the aircraft structure.

Three Oerlikon models have been developed. Firing the same projectile, they have suitably determined charges and differ only as regards rate of fire, muzzle velocity, length of barrel, weight and recoil force.

The model F has a muzzle velocity of 600 metres per second, a rate of fire of 520 rounds a minute, and weighs just under 51 lb. The corresponding figures for the model L are 750 *m/sec*, 450 rounds a minute and 66 lb., while for the model S they are 900 *m/sec*, 400 rounds a minute, and 86 lb.

All these models were designed to be fitted to free mountings, the model S being intended particularly for a trunnion mounting in the nose of a machine. The result obtained with these weapons led the manufacturers to develop similar equipment for single-seater fighters. The result was the Oerlikon-Hispano cannon engine which has been referred to on numerous occasions in *Flight*. This combination is now being built under licence by the Hispano-Suiza works, and the gun corresponds, in the main, to the Oerlikon model S. Its muzzle velocity is 830 *m/sec*, the rate of fire 300 rounds a minute, and the weight about 106 lb. As is generally known the gun is mounted between the cylinder banks of an Hispano Series X or Series Y engine, firing out through the airscrew shaft.

For Radials

Prompted by the popularity of radials in single-seater fighters, the designers set out to evolve suitable guns for installation in machines powered with this type of engine. Experiments were made with guns mounted rigidly in the wings. It was essential that excessive alteration of the wing profile should be avoided and that the barrel should not protrude too far beyond the leading edge. The gun had to be light and excessive recoil had to be avoided. Eventually the Oerlikon FF gun was evolved, and has the following characteristics: Muzzle velocity, 600 *m/sec*, rate of fire, 550 rounds a minute, and weight, 51 lb.

When an FF gun is installed within a wing it is mounted on specially designed members connecting the spars, adjustment being provided so that the trajectories of the two guns may intersect at any desired point. The trigger and safety catch are controlled by the pilot by Bowden cables or through a compressed air system.

Comparatively recently the Oerlikon concern has evolved the models FFL and FFS, intended for installation in larger and heavier aircraft. The muzzle velocities respectively are 750 and 900 *m/sec*. These guns are intended for mounting in the wings. The makers recommend that attack machines be fitted with fixed rifle calibre machine guns for fighting at close range in addition to cannons.

COMMERCIAL AVIATION

"Caledonia" over New York

THE WEEK AT CROYDON

International Co-operation : The New Generation : Northwards : A Little Flooding : Maze Guide

THE Russian Polar flights have awakened further interest in ice formation, though this is not the season for it. Actually, I believe it was too cold for ice to form on the Russian flights, but it is interesting to learn, anyway, that Imperial Airways, rather logically, are more interested in ant-icing devices than in de-icing—prevention being better than cure. A substance known as Kilfrost is being extensively tried out as an ice deterrent, and K.L.M. is interested, too, I hear. Some time ago Imperial and Kilfrost people went to Holland in this connection. Ice is so international a problem that there is a tendency in commercial aviation, at least, to pool information and for everyone to help everyone else as much as possible.

Talking of co operation, one day last week K.L.M. hired one of the British Airways' Lockheed Electras in order that one or two senior Dutch pilots should obtain experience with this type. A charter being a charter, the machine—with its British crew, of course, but with Commander Geisendorffer, one of the most senior K.L.M. pilots, also on board—took the 7 a.m. K.L.M. service carrying that company's load of passengers, freight and mail. A couple of days later the Lockheed returned, also on a K.L.M. schedule and fully loaded.

Captain "Jimmy" Youell has presented a novel prize to the school at which his son is being educated. It is a trip to Paris and back by Imperial Airways and it was won last week by eleven-year-old Peter Williams. It will soon be possible, by the way, to obtain statistics about the professions and occupations followed by the sons of airline pilots and other pioneers of commercial aviation. I believe several well-known names will be perpetuated in aviation, some as pilots: For example, a son of Mr. A. Plesman, managing director and founder of K.L.M., is at present a cadet pilot, training with the company, and I believe a son of Captain O. P. Jones hopes to follow in his father's footsteps. Several well-known aviation people have sons at Epsom College, the doctor's school, and there have been no fewer than three Brenards at Croydon in an aviation-journalistic capacity since I have known the place—which is since the first day it opened as a civil aerodrome. On that day, incidentally, Mr. Robert Brenard, now of Imperial Airways, was very much on the spot and since then his eldest son and a younger chip of the same block have successively been at Croydon as Air Correspondents.

Freightage

International Air Freight had a pair of bright red Curtiss biplanes out for an airing last week, and a burst of activity in the air freight business is expected to commence shortly.

North-Eastern Airways have taken delivery of a couple of D.H. Rapides just at the right time, according to Mr. Jacques (whose motto is: "I'll be in Scotland afore ye"). The services to and from Doncaster, Perth and Aberdeen are running fully loaded quite often just now, and passengers have had to be turned down recently. It was announced, too, early in the past week, that N.E.A. had become members of that excellent international club, the I.A.T.A., or International Air Traffic Association, whose annual meetings are always so skilfully chosen as regards climate, cuisine, wines and local sports. It is an awe-inspiring thing to find oneself a member and not unlike being elected to the Athenæum. Most Englishmen express their emotion on joining I.A.T.A. by purchasing an Anthony Eden hat of portentous blackness. One of the main advantages, too, is that once you join you must not cut fares or freight rates, and I have not, now I come to think of it, heard that International Air Freight has yet made application for I.A.T.A. membership.

There was a small ceremony on the tarmac on Friday of last week when members of the Netherlands Legation welcomed the new Netherlands Minister in London, Count van Limburg-Steerum, who arrived by K.L.M. in a Douglas D.C.3.

Not very long ago Olley Air Service had a special charter—from a romantic American, I believe—to fly away up north to Trondhjem, Norway, in search of the midnight sun. Apparently it never gets dark in those parts, and it seems just the place for a night club—or would it be called a day club?—with air transport to get you there and back.

Water, Water, Everywhere . . . .

Great fun was experienced on Thursday, last week, when there were quite deep floods on the aerodrome, and one sportsman found that the road from Rollason's up to the terminal building was two feet deep in water: whereupon he played flying-boats with his car up and down the road at speed, producing a bow wave of which even Capt. Wilcockson would not have been ashamed. Apparently the water came through the roofs in some hangars and just as men gazed upwards anxiously it burst forth also beneath their feet through manholes. One newspaper reported that in some town or other water rushed up through manholes bearing squealing rats with it, but that's nothing. At Croydon it brings up squealing members of works and buildings staff who have not been to the surface for years, and who invariably nonplus the authorities by demanding their back pay—or so they say.

Full marks must be given to the airport authorities for having stopped the flooding of the import sheds, which in the past happened fairly often, damaging air freight

Commercial Aviation

and creating ill-feeling from one end of Europe to the other.

There is an increasing demand here, especially amongst those who have not offices downstairs, for some form of notice-board in the main hall indicating room numbers upstairs and who lives where. Several people complain that for lack of such information business has been lost to them, and I frequently meet staggering, worn-out strangers, their boots in tatters, who have spent days walking round and round the upper and inner circle of corridors like blokes lost in the Australian bush. If they look like income-tax collectors I let them keep on walking, of course, or push them over the balcony.

Somebody roughly calculated that there were about 3,868 passengers in 649 machines in and out of Croydon last week.

A. VIATOR.

Australian Survey

THE northern coastline of Australia has now been surveyed and flying-boat bases have been selected. Between Darwin and Townsville sites have been selected at Groote Eylandt, near the western entrance to the Gulf of Carpentaria, and at Karumba, near the mouth of the Norman River. The survey was carried out by H.M.A.S. *Moresby*.

New Director of Imperials

VISCOUNT SWINTON, the Secretary of State for Air, has appointed Sir Francis L. Joseph, K.B.E., J.P., D.L., to be one of the Government Directors on the Board of Imperial Airways, in place of Sir Walter F. Nicholson, K.C.B., who retired on July 16 from that appointment after six and a half years' service. Sir Francis has already taken up his duties.

Trans-Canadian Equipment

IN addition to the four Lockheed 14s already mentioned as having been ordered by them, Trans-Canada Airways have also ordered three Electras for the transcontinental service developments. It is hoped that the Winnipeg-Vancouver section will be opened in September and that by next year the line will be extended to Montreal and Halifax. The first of the new equipment should be delivered next month.

Two-rows for the D.C.4

BOTH the Wright and Pratt and Whitney concerns have lately been testing new two-row engines of large capacity. Wright's effort—tentatively known as the two-row Cyclone—is specified for the Pan-American Boeing flying boats, while four of the new P. and W. Twin Hornets will be fitted to the 30-ton Douglas D.C.4 landplane.

The twin Hornet is a 14-cylinder unit with a displacement of 2,180 cu. in. Its take-off ratings are 1,400 h.p. at 2,500 r.p.m. on 95-octane fuel and 1,200 h.p. using 87-octane fuel. On "95" the normal rating is 1,150 r.p.m. at 2,350 r.p.m.

The "Lieutenant" Again

THE Latécoère transatlantic flying boat *Lieutenant de Vaisseau Paris*, powered by six 650 h.p. Hispanos, has during the past week been undergoing flying tests preparatory to carrying out experimental flights across the North Atlantic for Air France-Transatlantique, the new State-controlled French company of which M. Louis Allegre, Director-General of Air France, is president. The company is charged with the immediate establishment of a Paris-New York air service.

The pilot in control was Gonord, who reported satisfactory results in the tests, which included a half-hour fly-round at 2,000 r.p.m. and 9,000lb. load take-off. Fuel consumption tests are now being carried out.

The South American Project

EARLY this year it was announced that the Government would encourage the development of an experimental West African service, extending eventually to South America. Last week the details of the proposal were announced in a White Paper.

It is suggested that a three-year agreement should be concluded with British Airways for these experiments and to cover the existing Scandinavian service—the latter to include a night mail service to Berlin. The subsidy will be at the rate of £66,000 per annum, the company also receiving payment for the carriage of mails. As soon as the West African and South Atlantic route has been developed, payment will be made at a fixed rate for every flight, passenger and freight revenue being shared, but in the meantime, the basis will be that of out-of-pocket expenses. An equipment indemnity will be given to British Airways if no subsequent agreement is made. The company is to operate a training school for its own transport pilots.

Eurasian Extension

THE Chinese Ministry of Communications has recently approved the proposal of the Eurasian Aviation Corporation to open a direct ten-hour passenger and mail service between Peiping and Hong Kong. This service should start before the end of the month.

Rhodesian Changes

AN odd little ceremony, combining something of both a christening and a funeral, took place last month in Salisbury, Southern Rhodesia, when Lady Stanley, wife of the Governor, named the Rhodesian and Nyasaland Aviation Company's two new machines, and bade a last farewell to the Imperial *Astraea*.

Under the new system the R.A.N.A. machines are collecting and delivering mail at Beira, where the flying boats call three times a week.

An agreement is now being concluded whereby Wilson Airways will operate a Kisumu-Lusaka mail and passenger service to take the place of that part of the no-longer-used Imperial landplane service.

New Zealand Developments

FORCED to suspend operations owing to the cancellation of the licence of the Gisborne landing ground (due to necessary surface improvements), East Coast Airways are just getting into their stride again after nine months' holiday. Two D.H. Dragons are responsible for these excellent figures for the period January to mid-May, 1937:—Percentage of schedules completed, 99.6; miles flown, 54,048; passengers carried, 2,060; freight and mail carried, 4,289lb.

The company is unfortunate, during the winter, in being forced to leave Napier before the arrival of the mail train from Wellington, many passengers from which prefer to make the long journey to Gisborne by car at night, as the alternative to spending the night in Napier. This position will be remedied when the company decides to extend its service to Palmerston North to connect with rail and air services there.

The three Lockheed Electra machines ordered for Union Airways' new Auckland-Wellington service should by now have arrived and been assembled at the Hobsonville base. Mr. Moye W. Stephens, Jnr., of the Lockheed Corporation, was due to test them and give such instruction as may be necessary to the pilots.

With the good record of 92.2 per cent. of scheduled trips completed, it is interesting to learn that the Cook Strait Airways carried 14,269 passengers during the year ended March 31. 2,173 hours were flown and 41,303lb. of mail and freight carried.

At the annual meeting of the N.Z. Guild of Air Pilots, held at Blenheim, it was decided to affiliate with the G.A.P.A.N. of the British Empire. Two further important decisions were made, namely, that the Air Board be recommended to appoint a nominee of the Guild on the Board of Inquiry in cases where air accidents were being investigated or matters relating to civil aviation were being discussed, and that the Press be asked to refrain from publishing any suggested cause until such time as an official explanation was forthcoming from the Board.

Up to now such services as have been available have, generally speaking, been recognised as of a temporary nature only. As the leading air lines have now been in operation for twelve months and longer, the time has come for the radio question in New Zealand to be tackled seriously. The Minister of Defence has announced that R/T and W/T services will be available shortly, and tenders have already been called for D/F equipment for all the leading aerodromes. In addition, three blind approach systems are under consideration, these being intended for Rongotai (Wellington), Milson (Palmerston North), and Taieri (Dunedin). £35,000 has been set aside for this work and no time is to be lost in getting things under way.

BACK AGAIN

"Caledonia" and "Clipper III" Make Their Return Flights to Schedule

ON July 15 and 16 both the Imperial Airways boat *Caledonia* and the Pan American boat *Clipper III* made their return crossings, the former in 12 hr. 7 min. (162 m.p.h.) and the latter in 16 hr. 24 min. (121 m.p.h.). Unfortunately for the purpose of comparison, the average speed of the westerly wind across the Atlantic this time was less than 15 m.p.h.; even so, *Caledonia* proved herself faster in each direction, though the difference between the most economical cruising speed of each of the two boats does not appear to be much more than 20 m.p.h. in the Short boat's favour.

Capt. Wilcockson left Botwood at 10.25 (B.S.T.). An hour later he reported that he was making 146 knots (168 m.p.h.), and that visibility was "unlimited." At 12.55 p.m., he gave his position as 51.33 N. and 46.40 W.—about 350 miles from Botwood. During the first part of the journey, when slight headwinds were expected, *Caledonia* flew fairly low and then climbed over the clouds to 8,000 ft. for the second two-thirds of the distance. Her operator was in touch with Foynes on short-wave throughout and bearings were obtained from a number of ships; once above the cloud it was possible to use a bubble sextant.

Clipper III left Botwood at 7.25 p.m. (B.S.T.), and at 10 p.m. Capt. Gray reported his position as 52.51 N. and 16.24 W. By 11.30 the Sikorsky was 700 miles from the Irish coast. The two boats passed each other at 4.41 a.m. about 900 miles from Botwood.

Five more return flights are planned to take place before the end of September, when ice at Botwood will start to cause trouble. *Cambria*, with Capt. C. J. Powell in command, will take her share.

Caledonia had left New York at 6.25 p.m. (B.S.T.) on July 12 for Montreal, and duly arrived at Boucherville (about 10 miles from Montreal). She left on the next day for Botwood. *Clipper III* made her Southampton-Foynes passage on July 14 and, until the last moment, Capt. Gray had not received instructions concerning his route; the original idea was that he should fly back via Lisbon, the Azores and Bermuda, though no D/F facilities are available at the Azores.

Airways by Railways

"THE Empire's Airway" has started its tour of Britain's railways. In the coach are fine models of the D.H.34. of 1924, and, in contrast, the Armstrong-Whitworth Ensign of 1937. Similarly, flying-boat progress is demonstrated by models of the old Sea Eagle and the modern Short Empire boats.

A very interesting model of the wireless cabin of an Empire boat shows all the Marconi equipment, including the retractable loop aerial, and a Standard eight-valve superhet. ground station transmitter is also displayed, with cleverly arranged mirrors and lighting to show all aspects, while the main components are labelled. A further model is of the two sections of the Short Mayo composite aircraft.

Maps and charts show all the routes of Imperial Airways and their associated companies, together with traffic statistics. Incidentally, over 34,000,000 letters were transported in 1936, and the company's machines flew 5,083,139 miles, 64,474 passengers being carried.

Other details of the train and its visits were published in *Flight* of June 17. To-morrow an official Portsmouth opening will be held, followed by a public view on the 24th and 26th. From July 27 to 29 the coaches will be at Bournemouth; from July 30 to August 2 at Exeter; from August 3 to 5 at Taunton; from August 6 to 9 at Bristol; from August 10 to 12 at Cardiff; from August 13 to 16 at Swansea; and from August 17 to 19 at Gloucester.

THE LOSS of Mrs. AMELIA EARHART PUTNAM

THE U.S. aircraft carrier *Lexington* has now abandoned the search for Mrs. Putnam (still better known to many as Miss Earhart) and Capt. Noonan, after having scoured over 100,000 square miles and examined every island within hundreds of miles of Howland Island. Their Lockheed Electra left New Guinea for Howland Island on July 2. It is, in fact, inconceivable that two white people could still be alive after having been exposed so long in the tropics. One can only hope that after the fuel of their Electra was exhausted the end came quickly without prolonged suffering. It is a very tragic affair, and all the world joins in lamenting a plucky lady who flew because she loved flying and taking risks in the air, and who never tried to seek vulgar publicity once she had become famous.

Miss Earhart confessed in her early years that she had two ambitions, namely, to be the first woman to cross the Atlantic by air and to be the first woman to pilot an aeroplane across the same ocean. She fulfilled both. In June, 1928, she was given a seat as a passenger in a Fokker floatplane with three Whirlwind engines piloted by Commander Wilmer Stultz. A mechanic named Gordon made the third on board. The Fokker took off from Newfoundland on June 17 in that year, and twenty-one hours later it landed in Burry Port harbour in Carmarthen Bay, South Wales.

Miss Earhart was a pilot herself, and on April 8, 1931, she set up an Autogiro altitude record by reaching a height of 19,000 feet. She could only moderately indulge her passion for flying because her principal occupation was social welfare work among children in Boston. With her marriage to Mr. G. P. Putnam, of the famous publishing house, all financial difficulties disappeared, and she set about plans for flying solo across the Atlantic. She bought a Lockheed Vega with a Pratt and Whitney 420 m.p. Wasp engine. On May 20, 1932, she set off from Harbour Grace and after 13½ hours' flying she reached the coast of Donegal. She flew on to Londonderry and landed.

Four months later she made a new record for women by flying from Los Angeles to Newark, New Jersey, in 19 hours 4 minutes. The fastest transcontinental flight previously had been made by Frank Hawks, whose record was only 1 hour 25 minutes less than that of Mrs. Putnam.

Then, this year came the fatal determination to fly round the world. One can understand the attraction which such a project would have for such a woman. She knew the risk, and faced it. If there had been no risk there would have been less to attract her. Our deepest sympathy goes out to Mr. Putnam and to Mrs. Noonan.

The Battle's Performance

FITTED with the Rolls-Royce Merlin I glycol-cooled engine of 1,050 (max.) h.p., the Fairey Battle is capable of the following performance: Speed at sea level, 210 m.p.h.; speed at 15,000ft., 257 m.p.h.; speed at 20,000ft., 250 m.p.h.; service ceiling, 25,000ft.; climb to 10,000ft., 8 min. 24 sec.; climb to 20,000ft., 21 min. 24 sec.; landing speed (with flaps), 60 m.p.h.; cruising range with normal load, 1,000 miles; range at 257 m.p.h., 640 miles.

These figures were obtained during official trials which should be borne in mind when they are studied in comparison with calculated data for comparable foreign machines.

Constant-speed Airscrews

CONSTANT SPEED AIRSCREWS, LTD., ask us to point out that Mr. L. E. Metcalfe is no longer a director of the company and has no interest in it. This company are sole licensees of the V.D.M. airscrew and spinner, and the Governing Director is Major J. Galloway, V.D. Other members of the board are Mr. Robert Blackburn, O.B.E., Mr. Bernard T. Douglas, and Mr. T. C. Copson. Lt. Col. J. D. Blyth is chief engineer and general manager. The company is situated at Avon Works, Wharf Street, Warwick (Telephone Warwick 500), to which address all communications should be addressed.

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS

MOVE OF AIRCRAFT DEPOT, IRAQ

The Aircraft Depot, Iraq, closed at Hinaidi on June 15, and re-opened at Dhibban with effect from June 21.

DIGBY STATION

The R.A.F. Station, Digby, will be transferred to Fighter Command with effect from September 14.

NOMENCLATURE OF AEROPLANE

The name of the light reconnaissance seaplane manufactured by the Fairey Aviation Co., and fitted with a Rapier VI engine is Seafox I.

CO-OPERATION WITH 1st ANTI-AIRCRAFT GROUP

During the period September 1-4, exercises by day and by night in co-operation with the 1st Anti-Aircraft Group will take place. All aircraft not taking part in the exercises, except those stationed at Farnborough or Odiham, are not to fly within five miles of the Aldershot training area. This area is defined by a semi-circle of 9½ miles radius on the north-western side of a base line Windlesham-Aldershot-Borden.

In regard to aircraft stationed at Farnborough or Odiham, no night flying is to be carried out during the aforementioned period and by day the area is to be avoided, in the case of Farnborough by keeping to the south-eastward and in the case of Odiham to the westward.

OBSERVER CORPS EXERCISES

Observer Corps exercises were held on the dates and in the areas shown hereunder.

Air co-operation was provided by aircraft from the Bomber Command.

July.

12th. Hungerford — Reading — Staines—Guildford—Selsey Bill—South Coast Line (including Isle of Wight)—Poole—Salisbury—Hungerford.

12th. Long Sutton—Kings Lynn—Mildenhall—Clare—Royston—Uppingham—Long Sutton.

13th. Melton Mowbray — Oakham — Royston—Aylesbury—Eversham—Coventry—Melton Mowbray.

13th. Newmarket—Dunwich—thence East Coast and Thames Estuary to Corringham—Bishops Stortford—Newmarket.

15th. Royston — Epping—Chiswick—Ascot—Henley—Aylesbury—Leighton Buzzard—Shefford—Royston.

15th. Scarborough—thence East Coast to Saltfleet—Worksop—Wetherby—Pickering—Scarborough.

16th. Evesham—Banbury—Leighton Buzzard—Ascot—Kingsclere Marlborough—Swindon—Tewkesbury—Evesham.

16th. Spurn Head—thence East Coast to Kings Lynn—Market Harborough—Doncaster—Spurn Head.

19th.—On the North, East and South by the Coast Line: On the West by Chatham—Tunbridge Wells—Eastbourne.

19th. Hartlepool—thence East Coast to Filey—York—Wetherby—Askrigg—Hartlepool.

20th. Guildford—Tunbridge Wells—Bexhill—Coast Line on the South—Portsmouth—Farnham—Guildford.

20th. Sutton Bridge—the North and East Coasts of Norfolk and Suffolk to Aldeburgh—Lavenham—Newmarket—Sutton Bridge.

UNIVERSITY AIR SQUADRONS

Payment of landing or housing fees is not required in respect of a private aircraft used by a member of a university air squadron visiting a station other than his permanent station in connection with the work of his squadron.

STUDY OF FOREIGN LANGUAGES

The undermentioned officer and airmen passed the examinations held in April, 1937:—

MALAY

Colloquial

Sergt. B. Pook (Singapore).
Leading Aircraftman H. Mumby (Singapore).

INDIAN VERNACULAR

Urdu (Lower Standard)

Flt. Lt. A. M. Rodgers (India).

No. 2 FLYING TRAINING SCHOOL

The undermentioned officers have been awarded special assessments on completion of a course of flying training at No. 2 Flying Training School, Digby:—

Distinguished Pass

F/O. E. J. Boyle, A.P/O.s A. S. Phillips, C. B. G. Robinson, and J. G. W. Swain.

CENTRAL FLYING SCHOOL CATEGORIES

The undermentioned officers and airmen have been re-categorised as under:—

A.2—A.1

Flt. Lts. H. A. V. Hogan, H. W. Mermagen, G. D. Stephenson, D. Addenbrooke, J. W. Donaldson, Flt. Sergts. Glading, A. R., Newton, J. A., Pitcher, D. J., Sergts. Hart, J., Robinson, C. A., and Hellyer, C. W.

B.—A.2

Sqn. Ldr. J. N. Jaques, Flt. Lts. T. C. Chambers, A. F. Hamilton, F. C. Seavill, E. W. Whitley, W. R. Farley, S. F. Godden, A. R. G. Bax, R. H. Young, D. J. Alvey, D. Sloan, K. F. Ferguson, H. J. Kirkpatrick, J. N. H. Whitworth, P. E. Drew, F/O. V. E. Maxwell, P/O. J. G. Priest, Flt. Sergts. Jones, A. B., Holman, L. S., Sergts. Arnold, V. E., Burch, R., Landrey, F., Wheeler, J. C., James, G. T., Evans, W. D., Sergts. Hall, A. G., Holdway, C., Pickard, N., Bignall, J. S. W., Sherwood, H. G.

C.—B.

Flt. Lt. G. J. Grindell. Sergt. Wood, A. L.

Capt. J. E. O. Marais who recently underwent a test at the Central Flying School has been assessed at A.2 Category standard.

FLYING ACCIDENTS

The Air Ministry regrets to announce that P/O. Peter Edwards and Corpl. Thomas Henry Robson lost their lives in an accident which occurred near Salisbury on July 17 to an aircraft of No. 90 (Bomber) Squadron, Bicester. P/O. Edwards was the pilot of the aircraft and Corpl. Robson the passenger.

Also that Pilot Sergt. Raymond Arthur Mould lost his life in an accident which occurred at Betchworth, Surrey, on July 18 to an aircraft of the Royal Air Force Volunteer Reserve School, Redhill. Sergt. Mould was the pilot and sole occupant of the aircraft.

ROYAL AIR FORCE GAZETTE

London Gazette, July 13, 1937

General Duties Branch

The following are granted short service commissions as Acting Pilot Officers on probation with effect from and with seniority of July 1:—K. H. Appleton, L. C. Bartram, M. Booth, R. S. Chill, D. N. B. Cornwell, J. H. Dunn, C. G. Fisher, W. R. Foster, G. P. French, J. C. French, G. S. Fry, J. O. Gainford, A. C. Godfrey, G. A. W. Goodwin, O. R. W. Hammerbeck, S. C. Holbrow, H. J. Marley, J. W. Marsden, R. J. Melville Townsend, A. B. Mitchell, C. O'Donoghue, W. B. Price-Owen, J. M. Pryde, D. C. Skene, J. Stewart, W. J. Swire-Griffiths, J. N. Thornewell, R. D. Williams, D. S. Winning, G. C. B. Woodroffe.

The following Acting Pilot Officers on probation are confirmed in their appointments and graded as Pilot Officers on the dates stated:—J. F. Armstrong, R. H. Davis, E. H. Thomas, J. Tudor-Evans (July 10); A. K. Byrne, B. Drake, R. F. T. Giddings, K. J. McDonald, M. I. Murdock, A. A. Proctor, B. Romanoff, H. I. A. Swayne, C. M. Wheatley (July 13).

The following Flying Officers are promoted to the rank of Flight Lieutenant on the dates stated:—A. E. Cairnes (June 16); W. F. Beckwith, G. H. Foss, seniority November 28, 1936 (June 30); J. S. Leslie, P. B. H. Butler, T. B. Morton (Acting Flight Lieutenant) (July 9).

The following Flying Officers are promoted to the acting rank

of Flight Lieutenant on the dates stated:—N. W. D. Marwood-Elton (June 8); L. C. Bicknell (June 15).

P/O. T. G. Tideman is promoted to the rank of Flying Officer (April 14); Flt. Lt. D. W. Bayne is restored to full pay from half-pay (July 1).

The following Flight Lieutenants are transferred to the Reserve Class A (July 12):—F. G. Mason, M. A. Payn.

Lt.-Cdr. E. B. Carnduff, R.N., Squadron Leader, R.A.F., relinquishes his temporary commission on return to Naval duty (June 25).

Medical Branch

The commission of F/O. P. A. Wilkinson, M.R.C.S., L.R.C.P., is antedated to July 1, 1936, and he ceases to be seconded to the Derbyshire Royal Infirmary with effect from June 30.

Commissioned Engineer Officers

The following Warrant Officers are granted permanent commissions as Flying Officers on probation with effect from July 1, and with seniority of May 18:—E. D. Jackson, A. E. Clayson, A. Marks, A. E. Pearce, M. F. G. Mill, D.F.M., P. H. Scoley, C. H. Wilson.

Erratum

In the *Gazette* of June 29, notification concerning Lt. W. L. Mayo, R.N., Flying Officer R.A.F. For "*Gazette* of May 26" read "*Gazette* of May 26, 1936."

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

The following are appointed to the permanent service (July 1):—Sister Miss S. P. A. Byrne, Sister Miss D. M. Jones, Staff Nurse A. R. Posselt.

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers
General Duties Branch

Capt. G. A. Wells, M.C., is granted a commission as Flight Lieutenant in Class C (May 13); F/O. C. H. Glover is granted the honorary rank of Flight Lieutenant (May 7); P/O. J. Shaw is promoted to the rank of Flying Officer (June 20); F/O. P. T. Stephens is transferred from Class AA(ii) to Class C (July 7); F/O. E. A. H. Fisher relinquishes his commission on completion of service and is permitted to retain his rank (March 15); F/O. J. K. Flower relinquishes his commission on completion of service (June 4); F/O. J. A. Slater relinquishes his commission on appointment to a short service commission in the Royal Air Force (June 20).

AUXILIARY AIR FORCE

General Duties Branch

No. 604 (COUNTY OF MIDDLESEX) (FIGHTER) SQUADRON.—P/O. P. C. Wheeler is promoted to the rank of Flying Officer (June 6).

No. 607 (COUNTY OF DURHAM) (FIGHTER) SQUADRON.—P/O. J. M. Bazin is promoted to the rank of Flying Officer (June 9).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commanders.—F. A. Norton, to Directorate Technical Development, Air Ministry, 5.7.37. A. P. Ritchie, A.F.C., to Headquarters, R.A.F., Middle East, Cairo, Egypt; for Intelligence duties, 21.6.37.

Squadron Leader.—W. J. M. Akerman, to No. 115 (Bomber) Squadron, Marham; for flying duties, 28.6.37.

Flight Lieutenants.—P. de G. H. Seymour, to No. 28 (Army Co-operation) Squadron, Ambala, India, 2.5.37. D. W. Bayne, to R.A.F. Depot, Uxbridge; for Administrative duties, 1.7.37.

Flying Officer.—A. J. Guthrie, to No. 115 (Bomber) Squadron, Marham, 28.6.37.

Pilot Officers.—E. W. Yates, to No. 66 (Fighter) Squadron, Duxford, 30.6.37. D. F. B. Sheen, to No. 72 (Fighter) Squadron, Church Fenton, 30.6.37. K. A. Merritt, to No. 88 (Bomber) Squadron, Waddington, 30.6.37. P. J. C. Canney and W. B. S. Simpson, to No. 110 (Bomber) Squadron, Waddington, 30.6.37. L. Vincent, to No. 115 (Bomber) Squadron, Marham, 30.6.37. C. L. Gilbert, to No. 214 (Bomber) Squadron, Feltwell, 30.6.37. J. E. Innes-Crump, to No. 218 (Bomber) Squadron, Upper Heyford, 30.6.37. E. H. Jago, to No. 64 (Fighter) Squadron, Martlesham Heath, 30.6.37. J. R. G. Finlayson, to No. 83 (Bomber) Squadron, Turnhouse, 30.6.37. D. G. Simmons, to No. 105 (Bomber) Squadron, Harwell, 30.6.37. J. D. Ronald, to No. 151 (Fighter) Squadron, North Weald, 30.6.37. J. D. S. Huxley, to No. 233 (General Reconnaissance) Squadron, Thornaby, 30.6.37. P. H. Bragg, J. F. Newman, A. E. Pringle, R. H. Sleigh, and M. L. Wells, to No. 115 (Bomber) Squadron, Marham, 28.6.37. T. W. Piper, to No. 148 (Bomber) Squadron, Scampton, 28.6.37.

Acting Pilot Officers.—G. A. McWhinney, to No. 2 Armoured Car Company, Ramleh, Palestine, 5.7.37. C. Murray and G. E. Thompson, to No. 34 (Bomber) Squadron, Lympne, 30.6.37. J. W. Fordham and F. L. Litchfield, to No. 37 (Bomber) Squadron, Feltwell, 30.6.37. E. N. Ryder, to No. 41 (Fighter) Squadron, Catterick, 30.6.37. C. T. V. Craxton, to No. 66 (Fighter) Squadron, Duxford, 30.6.37. J. C. H. Blake, to No. 82 (Bomber) Squadron, Cranfield, 30.6.37. L. H. Baker, to No. 88 (Bomber) Squadron, Waddington, 30.6.37. B. R. Kerridge, to No. 98 (Bomber) Squadron, Hucknall, 30.6.37. J. A. Ingram and A. L. Vipan, to No. 103 (Bomber) Squadron, Usworth, 30.6.37. E. D. Chantler, E. G. F. Chivers and R. S. C. Wood, to No. 115 (Bomber) Squadron, Marham, 30.6.37. A. McPherson, to No. 139 (Bomber) Squadron, Wyton, 30.6.37. K. B. Corbould, J. W. B. Davis, B. O. Dias, J. R. S. Romanes, M. A. Scott, and R. H. Thompson, to No. 206 (General Reconnaissance) Squadron, Bircham Newton, 30.6.37. W. B. Baxter, to No. 207 (Bomber) Squadron, Worthy Down, 30.6.37. E. G. Winning, to No. 213 (Fighter) Squadron, Church Fenton, 30.6.37. D. H. Lowe, to No. 214 (Bomber) Squadron, Feltwell, 30.6.37. A. R. H. Beauman and R. H. James, to R.A.F. Station, Gosport, 30.6.37. J. G. McGrail and D. J. Rogers, to No. 7 (Bomber) Squadron, Finningley, 30.6.37. R. A. Holloway, to No. 51 (Bomber) Squadron, Boscombe Down, 30.6.37. D. R. Hoar, to No. 58 (Bomber) Squadron, Boscombe Down, 30.6.37. T. H. T. Forshaw, to No. 73 (Fighter) Squadron, Debden, 30.6.37. G. S. K. Haywood, to No. 74 (Fighter) Squadron, Hornchurch, 30.6.37. R. T. Chisholm and C. G. Saunders, to No. 113 (Bomber) Squadron, Upper Heyford, 30.6.37. H. R. MacD. Beall and M. H. Roth, to No. 142 (Bomber) Squadron, Andover, 30.6.37. M. J. Earle, J. T. L. Shore and T. W. Storey, to No. 148 (Bomber) Squadron, Scampton, 30.6.37. R. E. Shorter, to No. 166 (Bomber) Squadron, Leconfield, 30.6.37. D. L. R. Halliday and D. P. W. R. Robinson, to No. 207 (Bomber) Squadron, Worthy Down, 30.6.37. E. D. Godfrey, H. E. Hopkins, A. J. Mould, C. A. Wallis and R. D. Williams, to No. 233 (General Reconnaissance) Squadron, Thornaby, 30.6.37. H. J. Seagrin and W. B. Smith, to R.A.F. Station, Gosport, 30.6.37.

Equipment Branch

Group Captain.—F. A. Baldwin, to Headquarters, No. 30 (Balloon Barrage) Group, London; for Equipment Staff Duties, 5.7.37.

Squadron Leader.—F. B. Ludlow, O.B.E., M.C., to Directorate of Equipment, Air Ministry, 5.7.37.

Medical Branch

Wing Commander.—T. McClurkin, to Special Duty List, whilst seconded for duty with the Medical Research Council, 1.7.37.

Squadron Leader.—J. Parry-Evans, to R.A.F. Depot, Uxbridge, whilst attending post graduate course of study at the Royal Infirmary, Edinburgh, 5.7.37.

Flight Lieutenants.—V. H. Tompkins, to Princess Mary's R.A.F. Hospital, Halton, 8.7.37. I. MacKay, to Medical Training Depot, Halton, 7.7.37. H. F. Harvey, to No. 9 Flying Training School, Hullavington, 8.7.37. G. A. M. Knight, to Central Medical Establishment, London, 1.7.37. E. B. Harvey, to Marine Aircraft Experimental Establishment, Felixstowe, 5.7.37.

Flying Officers.—J. H. L. Newnham, to Medical Training Depot, Halton, 1.7.37. P. A. Wilkinson, to Medical Training Depot, Halton, 1.7.37. D. J. Dawson, to R.A.F. Section, Hendon, 1.7.37.

Forthcoming Events

July 23-August 1. Swiss International Meeting.
July 24. Devon Air Day and Race: Plymouth and Exeter.
July 30-August 15. "Avia" Aero Exhibition, The Hague.
July 31. Cinque Ports Flying Club: Folkestone Aero Trophy Race.
July 31-August 2. Yorkshire Gliding Club: Opening Meeting, Sutton Bank.
August 1-14. Yorkshire Gliding Club: Instructional Camp, Sutton Bank.
August 3-September 7. Public Schools Aviation Camp, Norwich.
August 6-7. Austrian Aero Club: International Rally, Lake Worth.
August 14. Eastbourne Flying Club: At Home.
August 14-22. Yorkshire Gliding Club: Open Contest, Sutton Bank.
August 20. L'Aéro-Club de France: Marseilles—Damascus—Paris Race.
August 21. Thanet Aero Club: Aviation Meeting and Race.
August 21. Midland Aero Club: At Home.
August 22-29. Italian Aero Club: Circuit of Littorio.
August 28 and 29. Cinque Ports Flying Club: Lympne International Rally and Wakefield Trophy Race.
August 28-September 25. B.G.A. National Soaring Competition, Great Hucklow.
September 4 and 5. Southend Flying Club: At Home.
September 10-11. R.Ae.C.: King's Cup Race.
September 12. Aero Club de France: Coupe Deutsche de la Murthe, Etampes.
September 23. Aero Golfing Society: Cellon Trophy.

PRIVATE FLYING

GLIDING CENTRE : Nowadays there is quite a young town on the Wasserkuppe, as this photograph, which was taken during the International Competitions, adequately shows. The last phases of the fortnight's sport are described on pp. 98 and 99.

Topics of the Day

Odious Comparisons

AFTER a fairly mixed piece of flying last week-end, with clouds again practically on the deck—along the South Coast this time—I proceeded afterwards to do some motoring and found it very difficult to see why everyone who could afford it did not use an aeroplane in summer and on fine winter days. However disturbing it may be to chase along railway lines, wondering when and if one is going to be turned back, it is not, even in these circumstances, necessary to be quite continuously on the alert, and I was less tired, after about a hundred miles of varied to bad flying weather than I was later on after ten miles of driving amidst the week-end motorists.

It may be extremely unpleasant to be forced to find a large field or aerodrome and to spend the night in the vicinity, but it is equally unpleasant to wait for ten minutes behind a couple of gently interlocked cars whose drivers, pale with strain and annoyance, are shouting at one another in a tone of voice which they would never think of using in the ordinary course of events. Generally speaking, there is no question of putting down in any field or aerodrome, and one can sit up at 2,000ft. watching the black beetles crawling by the thousand along the extremely narrow roads.

We are all occasionally frightened badly in the air, but pilots are at least saved, for instance, that continuous strain of driving in the dark while every impatient driver is hooting his way along with undipped head lamps and every inexperienced driver is grimly hugging the crown of the road.

If I could afford it I would fly everywhere and consider the hours or days spent at different aerodromes waiting for the weather to lift as a small payment to make for the relief of having the sky, in due course, more or less to myself. Only for a few minutes during the take-off and the approach and landing is the pilot in anything resembling the neurotic lather suffered in nearly every minute of the hours spent during a long drive. Perhaps at the moment I am feeling biased; I certainly met some awful thugs in large American saloons, and some fearful idiots in small, mass-production devices during the short two hours of my driving last week-end. Contour chasing under a low ceiling was plain fun by comparison.

Know Your Machine

SOME time ago I spent a week-end with an engine designer in or about a machine which was fitted with his own engine. I realised then just how useful it can be to understand fully what is going on inside and felt that we ought all to go through a course of engine and airframe maintenance instruction.

What do any of us really know about the machines we fly? Next to nothing. We know how to fold and unfold the wings, and how to start an engine. If the pressure filter flange joint springs a minor leak can we do anything about it? Not often; rarely do we know where all the oil is coming from. Even if we did we might do a bit of illegal mending, but we should at least not be left to hang about helplessly while a G.E. carried out some absurdly simple little adjustment.

Possibly the average pilot prefers not to know anything about his machine. In complete ignorance he is worried by nothing except the fuel and oil level, whereas filled to bursting point with engineering knowledge he might suffer quite unnecessary agonies in the air while he thought about that which he had done or left undone. The average transport pilot's car is the most awful, neglected mess that it is possible to see, and I can think of only two well-known designers who fly themselves. On the particular occasion mentioned the designer did, in fact, worry himself, quite rightly, about the doubtful engine note at one point. The mixture control had been set too weak. I hardly noticed the exhaust change, but then I shouldn't have fiddled with the mixture control much below 5,000ft.—we were flying at 2,000ft.

Necessary Worries

INCIDENTALLY, it is in such circumstances—when the mixture control might, for instance, have become stuck in the weak position (if such a thing is possible)—that devices like thermo-couples can be very valuable.

In a general way cylinder-head temperature gauges and the like merely add another worry, but the indications given are sometimes vitally useful, saving a damaged engine if not a forced-landing crack-up. Flying last week in a very fully equipped machine, I noticed that the average head temperature had reached 400 deg. C., and the "first pilot" eased things back a little for the rest of the medium-pitch climb. With V.P. airscrews, high-compression engines and mixture controls which are designed to be used, the pilot of a modern aeroplane needs rather more than an oil-pressure gauge to keep him informed of the state of his power unit.

The majority of mechanically minded individuals like to have a lot of things to look after, just as the really keen amateur finds ordinary cross-country flying something of a bore and proceeds unnecessarily to solve various navigational problem.

INDICATOR.

FROM the CLUBS and SCHOOLS

REDHILL

A TOTAL of 70 hr. 10 min. flying was recorded for the week ended July 16, Messrs. O'Brien and A. Cudden-Fletcher completed their "A" licence tests and Mr. Hipperson made his first solo.

NOTTINGHAM

A very successful Dawn Patrol was held on Sunday, July 4, when nine machines visited Tollerton from the Leicester, York County, Sheffield and Lincolnshire clubs. Numerous cross-country flights were made, establishing a total of twenty-nine hours flying.

YAPTON

The unsuitable weather has been responsible for the low flying times—34 hours—recorded by the Yapton Aero Club, although there has been a steady increase in the membership. Mr. L. G. Hamlet made his first solo and Mrs. E. Scott was successful in her "A" licence tests.

SOUTHEND

In spite of unsettled weather flying times for last week were up to average. The club was very busy giving joy-rides to members of the public who called to see the members of the camp of the Auxiliary Air Force from Abbotsinch. Mr. F. F. Gosford made his first solo.

NORTHAMPTON

Future events at the Northamptonshire Aero Club include a demonstration of the Kronfeld ground trainer on July 24 and 25, and a dance of July 30. Flying hours are well above the average and many cross-country flights have been carried out—including several to the Continent.

C. A. S. C.

On Saturday last members were on duty at Portsmouth aerodrome on the occasion of the Garden Party. On the following day flying times at Cambridge totalled 10 hours, and eight members flew to Witney for the Garden Party there. Mr. H. Guest upheld the status of the club by winning the first prize in the arrival competition.

BORDER

The cyclists attending the Glasgow Fair Week discarded their bicycles and took to the air, causing quite a rush for joy-rides. The aerodrome buildings have been repainted and flower beds are beginning to bloom, making the airport quite a pleasant rendezvous, and the members have taken to sunning themselves between flying and deck tennis.

HANWORTH

Excellent weather conditions made possible several cross-country flights, including two to Cambridge. Demonstrations of the Aeronca were carried out at the Portsmouth and Witney parties. The club was also represented at Deauville by the Leopard. A flying total of nearly 116 hours was recorded for the week. Mr. Rees completed his "A" licence tests.

HERTS AND ESSEX

During the month of June flying times were 379 hours, a slightly lower figure than that for the corresponding month of last year, due to the fact that two Moths were out of service for C. of A. An air display on Sunday, July 11, organised by the Club Pilots' Committee, drew an enormous crowd of spectators and was very successful. Messrs. Torra, Goodwin, Dalby and Andrews completed "A" licence tests, a first solo being made by Mr. Brymer.

NORFOLK AND NORWICH

A demonstration by the Norfolk Gliding Club was given one day last week when a number of flights were made. During week ended July 18 nearly 50 hours were flown. The chief instructor is making steady progress after his operation and he has left the nursing home; Mr. Kirkby, in the meantime, is being kept busy with instructional duties. A number of cross-country flights were made with landings at Gravesend, Cambridge, Redhill and Heston. A notable visitor to the Club was Sir Samuel Hoare, the Home Secretary, in a D.H. 89, having flown from Portsmouth after inspecting the co-ordination exercises.

CINQUE PORTS

Mr. and Mrs. Davis flew in the Leopard Moth to the Deauville party last week-end; the Puss Moth was also flown over by Mr. E. Symmons. Members are reminded that the Folkestone Aero Trophy Race will be held on July 31. Of the new members, Mr. A. M. Dunlop, who is taking his "B," made his night flight from Lympne to Croydon on Saturday. (Is this, then, the mystery flyer?) Mrs. Drake and Messrs. Proudlock, Sharwood-Smith and Rahb made their first solo flights, while Messrs. Proudlock and Sharwood-Smith and Capt Lethbridge were also successful in their "A" licence tests. Flying hours for the week were well over the average, 85 hours being recorded despite the fact that the Moth had been sold to the Eastbourne Club. This machine has been replaced by a Swallow.

YORKSHIRE

A total flying time of 67 hr. 20 min. for last week was helped by cross-country trips to Edinburgh, Manchester, Liverpool, and so on. Mr. H. Reid joined the Aviation Group. An interesting visitor of the week was Mr. Bertram Mills, Jnr., in his Hornet Moth.

CAMBRIDGE

Flying times at Marshall's School for the week ending on July 18 totalled 78 hr. 25 min. Cross-countries were flown at Hatfield, Witney, Gatwick and Leicester. Members who are taking their "B" licences have been doing a good deal of blind flying and cross-country work. The Puss Moth was flown to Cannes.

LONDON

Last week, at the London Aeroplane Club, Mr. J. de Havilland completed the tests for his "A" licence and Mr. G. E. Florman made a first solo. The flying times for the week ended July 18 amounted to 133 hours. New members were Messrs. P. K. Crowther, P. Michelson, N. J. Matthews, G. T. Hopkinson, and R. D. Wilson.

BROOKLANDS

A number of members have expressed the desire to fly to Paris to see the Exhibition, and the management has decided that, provided sufficient support for the flight is forthcoming, the Flying School will be closed from midday on Sunday, August 1, until the following Tuesday. Full particulars of the plan may be obtained from Capt. Duncan Davis. Eight machines took part in the Leicester patrol, the high spot of the proceedings being the action of the formation leader, who successfully led his charges to Desford instead of Braunstone! Messrs. McLeod, Wiggins and Archell made their first solo flights, and successful "A" licence candidates were Messrs. Archell, Hopkins and Barhett.

Weather Broadcasts

THE weather broadcasts from Borough Hill are now, and until further notice, being transmitted on 245 k/cs (1,225m.). Previously the wavelength was 1,176m. Listeners are asked to send reports on the effect of this change to The Secretary, Air Ministry (Signals 2), Ariel House, Strand, London, W.C.2.

Devon's Day

AT the time of going to press fourteen entries had been received for next Saturday's Devon air race, which is to be flown over a seventy-five mile course starting and finishing at Plymouth Airport and taking in the two other aerodromes in the Whitney Straight West-Country chain, Haldon (Teignmouth) and Exeter.

At each of these aerodromes a flying display—one item of which will be a fly-past by R.A.F. boats from Mountbatten—will take place, beginning at 2 p.m. in each case. The race starts at 3.30 p.m. A dance (evening dress) takes place at Teignmouth afterwards

Extraordinarily complete plans for running this "three-cornered" meeting have been drawn up, and the organisers feel that all that is required to ensure success is the co-operation of competitors and visiting pilots in observing the rules.

The Lancashire Party

UNQUESTIONABLY the feature of the Lancashire Aero Club's garden party at Woodford on July 10 was the aerobatic display by Flt. Lt. Geoffrey Tyson, former inverted flying exponent for Cobham's, and now following the comparatively respectable job of test pilot for A. V. Roe. As this was a special occasion—a very special occasion judging by the size of the party—Tyson produced something new to startle the onlookers. His manœuvre was an inverted loop, performed at no feet to speak of, so spectacular that even hardened people like Alan Goodfellow, back at the old club for the gliding, exclaimed that he had never seen anything quite like it. Inverted stalls and an inverted spin rounded off Tyson's show. He used an Avro 626.

The principal competitive event was a cross-country trial over Lancashire and Cheshire, in which three club members took places. They were C. C. McCracken, A. L. Ward and Dr. Merrin, all flying Cadets. Mr. Elwell, in charge of the Taylor Cub, proved the most successful visiting pilot. He won both the balloon-bursting and the bombing competitions, hovering about as he could in the strong wind. No. 611 Auxiliary Squadron from Speke paid a visit in charge of Flt. Lt. Salter, and appropriately won the arrival competition. The Hawker Harts gave a grand show of formating. Several glider flights were made by members of the Derbyshire and Lancashire Gliding Club, with Basil Meads and Alan Goodfellow in charge.

Private Flying

A LITTLE CUBBING

Some Impressions of the Taylor Cub : America's Idea of the "Flivverplane"

An idea of the range of vision provided for the pilot of the Cub may be gathered from this view, which, however, does not show how the starboard side can be opened right up for summer flying. (*Flight* photograph.)

NOW that they have become accustomed (again) to the idea of low-power flying, pilots are beginning to expect something more from a machine than a mere capacity to rise in the air and return to the ground. They are, in fact, and rightly, demanding a full-size take-off a short landing, reasonable travelilng comfort and space for luggage.

As one might expect from a country producing its own special brand of private-owner types, one of America's most successful contributions to the idea of flying-by-the-man-in-the-street, the Taylor Cub, is, in many respects, simply a scaled-down version of the "formula" which has, during the past few years, been most popular in the bigger sizes—the high-wing cabin monoplane, of mixed wood and welded steel tube construction, with straightforward flying characteristics. The scaling-down, however, has not merely been in the matter of size, but in all-round performance and handling qualities. Instead of 130 m.p.h. we have 85-90 m.p.h. as a top speed, but instead of 55 m.p.h. as a landing speed we have 30 m.p.h. or lower; the wing-loading has come down to suit the purposes of the machine, and the controls are lighter in proportion. At the same time these are pleasantly powerful and remain operative right down to the stall.

Generally speaking, the machine flies more like a lightly loaded Mark I Moth than anything else, though the take-off is a good deal better (to the point, in fact, of being quite phenomenal when flown one-up), and the stall less pronounced. It is safely possible to bring the Cub in on a half-stalled side-slip, with the controls in two opposite corners; the pilot still has plenty of control left to take off bank and carry out the landing. One does not recommend this method of approach as a normal procedure, but it would be useful if it was necessary to put the machine down in a very small space. To quote another instance of controllability, we brought the Cub into Hanworth slightly off-wind, discovered the fact with only about 5 m.p.h. of air speed to spare, and flat-turned into wind without difficulty or delay by use of the rudder alone. The majority of machines would have skidded for the first second or so and the drift would have been more pronounced than ever at the moment of contact.

Stalling tests at a safe height showed that the Cub merely sank on a level keel with the stick right back, while the nose rose and fell gently against the horizon. The application of rudder caused a wing to drop momentarily, but there was no tendency for the machine to flick into a spin. Apparently the Cub can only be made to spin on wide throttle openings—a deficiency which, from the instructional point of view, can be treated as a good or bad thing according to one's attitude to such things.

THE TAYLOR CUB (J.2)

40 h.p. Continental Flat-four Engine

Span	35 ft. 5 in.
Length	22 ft. 5 in.
Weight, empty	563 lb.
All-up weight	970 lb.
Maximum speed	90 m.p.h.
Cruising speed	75 m.p.h.
Take-off run	125 ft.
Landing run	100 ft.
Range	200 miles
Price	£460.

Concessionnaire: A. J. Walter, 37, Lancaster Close, St. Petersburgh Place London, W.1.

The occupants sit tandem-wise, the machine being normally flown from the rear seat. There is, however, plenty of trimming range and one can fly solo from the front seat if preferred, the only risk in this case concerning a possible landing on rough or muddy ground, when the forward position of the c.g. might cause a nose-over. The all-round view from either seat is excellent by cabin standards, and the two-piece door on the starboard side can be fully opened or completely removed for summer flying (if any). Curiously enough there is little or no draught when these panels are open, yet quite a lot is experienced when the port-side window is opened by itself.

Unfortunately the A.S.I. on this particular machine was virtually useless, merely showing nothing much at maximum speed and rather less at the stall. However, the standard spring-loaded strut indicator appeared to be telling a fairly true story; at cruising revolutions (2,200 to 2,300 r.p.m. with the Continental flat-four) this indicator showed 70 m.p.h., and at maximum revolutions (2,500 r.p.m.) it showed 85 m.p.h. On a carefully timed flight from Hanworth to Hatfield and back, with a 20 m.p.h. beam wind, the Cub's cruising average—including a climb to 1,500 ft. at each end but not the take-offs and landings—worked out at 62 m.p.h., a figure which, in the circumstances, tallies fairly well with that indicated. The effect of the wind alone, apart from the climbing periods, would account for 3 or 4 m.p.h.

In standard form the Cub is sold with the barest essential flying and engine instruments. Different buyers will require the machine for different purposes and additional instruments can be ordered as required. The wings do not fold. The official figures are given in the accompanying table.

Although the price of the imported Cub is necessarily high by ultra-light standards, there should be a niche in the market for a machine which is quite practical and which can be used for training or leisurely touring at very small running costs. Not only can the machine be put into ridiculously small spaces, but it can also be flown out of them with safety; as a flying device pure and simple it is as nearly foolproof as any fixed-wing machine can be; and the Continental engine uses an average of 2.7 gallons of fuel an hour in general work.

Another Foreign Handbook

LAST week the Air Ministry issued No. 16 of the *Foreign Air Regulations Handbooks*. This covers Italy, with its multitude of prohibited areas.

The Folkestone Trophy

THE Folkestone Aero Trophy race is being run this year on handicap over the same course as usual—from Lympne to the Capel airship shed, Folkestone harbour head, Hythe gasholder and back to Lympne. This circuit is flown three times in a clockwise direction, the total mileage being 55.

The handicappers are, as usual, Messrs. Rowarth and Dancy, so a close and exciting finish may be expected. The prizes are: First, £50 and trophy; second, £25; and third, £10. There is also a speed trophy and £10 for the fastest lap. The entry fee is £2 2s., and normal entries must be in by July 23. Late entries can be received up to July 26.

Unlucky Portsmouth

BY way of a change from the conditions at last year's Portsmouth Garden Party, when a gale of wind blew hats and light aeroplanes about the place, this time there were very low clouds and light rain. It was no consolation to the organisers to know that the Meteorological Office had predicted such conditions over part of the south coast and still less to learn that Shoreham had sunshine and six miles' visibility, while the aeronaut could see for thirty miles at Croydon. However, things might have been worse; QBI was in force at Southampton and half the Jersey Airways' pilots were forced to return to the mainland because the clouds were right on the ground at their objective.

However, save for the display of aerobatics, due to be carried out by the Club's chief instructor, Flt. Lt. Williams, everything went off more or less according to plan, though even the Portsmouth Gliding Club's machines, which performed at the end of the proceedings, disappeared promptly into the clouds almost before the tow-car had got going. Travelling sedately towards Portsmouth at 2 p.m. in the Miles Whitney Straight with Mr. Gordon Marshall the clouds were just comfortably clear of the South Downs. At 6 p.m. these clouds were only just comfortably clear of the *lowest* ground, and we made our way Bradshaw-wise along the coast to Brighton before turning inland to Heston. One or two people, flying machines with a less excellent forward range of vision, called it a day and presumably spent the night at Portsmouth.

Despite this wintry bit of summer some two hundred members and guests turned up at the airport to see about a score of variegated visiting machines which had duly put down between 14.00 and 14.30 hrs. in an endeavour to win one of the three cups for the arrival competition. These were won respectively by Messrs. Henderson, Marriage and Marshall. Thereafter, passengers in one of the Club's Moth Majors and in the Hawk Major proved their skill in direct semi-dive bombing (with flour bags) and the various demonstration machines were put through their paces both severally and collectively while members of the public chose which they considered to be the smartest and best-kept of them. The vividly attractive Wicko took their special fancy, and Mr. Wikner duly collected the cup, which had previously been offered for the temporarily abandoned Isle of Wight race. The runners-up were the Miles Whitney Straight (Mr. Gordon Marshall again) and the Short Scion Senior (flown by Mr. Piper).

At the end of the proceedings a most impressive fire-fighting demonstration was staged in which acres of neat petrol were set alight and put out more or less instantaneously with the help of CO_2.

After a brief and pointed explanatory speech by Mr. O. R. Guard the prizes were presented by Lady Rose, and the more stalwart aerial visitors left to joust with railway signals and tall trees.

Oxford Occasion

THE Witney Aeronautical College and the Witney and Oxford Aero Club had their big day last Sunday, when a pleasant little garden party culminated in the official opening of the new residential mess by the Rt. Hon. Lord Sherbourne, D.S.O.

Between 2.30 and 3.30 p.m. an arrival competition helped to fill the aerodrome with aeroplanes and visitors, the road added its share, and by the time Mr. Kronfeld took-off his Drone to open the demonstrations, he had a large audience to watch his performance, which, as usual, included the hands-off fly-past and landing that so nicely demonstrate the Drone's stability.

The chief instructor of the Bristol and Wessex Aero Club, Mr. E. M. H. Slade, who was previously a Witney instructor, took over with a display of aerobatics, which included several low loops. His mount was an Avro Cadet.

The Autogiro, demonstrated by Mr. R. A. C. Brie, was watched with keen interest until the loud speaker gave first warning of the approach of a formation of Hawker Hinds from No. 605 (County of Warwick) Bomber Squadron. The College School of Wireless made R/T. contact with the machines, which then proceeded to demonstrate flight drill, and afterwards landed, thus giving the populace an opportunity for close-up inspection.

Due, apparently, to the excellence of the tea delaying guests of honour and officials, the opening ceremony was postponed until 5.30 p.m. Speeches were almost impossible, due to the persistence of enthusiasts demonstrating a Drone and an Aeronca, so that Lord Sherborne had to be content to declare the new mess open after a few words of introduction.

Prizes were then given for the arrival competition by Mrs. Lawrence Wingfield. Winners were Messrs. R. T. Dew and H. Guest, of the C.A.S.C., flying a Gipsy Moth, Mr. E. M. H. Slade on the Cadet, and Mr. A. O. Cundy, an ex-Witney pupil who has recently qualified for a "B" licence. R. G. Secretan received a cup as best pupil of the year.

"Will this be the last time"? An enforced silence at the Witney party while a demonstrating machine makes its umpteenth low passage overhead. Mr. G. Arthur Wingfield (holding paper), the chairman of Universal Aircraft Services, is introducing Lord Sherborne, who officially opened the new mess. Seated on the right is Mrs. Lawrence Wingfield who presented the prizes in the absence of the Lady Mayoress of Cardiff.

An afternoon which had been merely fine turned so hot after tea even Mr. S. W. Saunders, the aerodrome manager, allowed himself a few moments' respite to drink with others to the success of the College and club. The College now has eighteen resident pupils. The new mess is a pleasant, comfortable building near the small club house. Across the tarmac is the large hangar, off which are the engine shop, carpenters' and dope shops, and navigation and wireless room. The spectacle of a Bristol fighter, newly doped and in first-class condition, came as a surprise on entering the hangar.

Mr. D. L. Townsend is principal of the college, which has now turned out a large number of experienced pilots and qualified wireless operators. At the moment the college is run on entirely civil lines and the pupils, usually straight from public schools, pay for their complete course.

Deauville Week-end

THE weather last week-end favoured all the British private owners on their way to the Rally organised by the Deauville Aero Club. From 9.30 on Saturday morning there was a continuous stream of aeroplanes arriving, and by lunch time over fifty machines had turned up. Mr. Lindsay Everard, M.P., President of the Royal Aero Club, in his Dragonfly smartly painted in the Household Brigade colours, headed the list of English arrivals.

There was the oddest sort of arrival competition. Every pilot on landing was met by the members of a special committee of the club who greeted him with a message of welcome, to which the guest had to reply suitably in one sentence, the most gracious effort receiving first prize.

Presumably this was an effort (one hesitates to call it a hint) to raise the standard of linguistic ability, oratory and expression amongst touring private owners. The competition was won by Mr. Lindsay Everard, with Mr. Webb second and Capt. Percival third. Mr. Everard, one feels, ought to have been handicapped severely as he is a member of that eloquent body of legislators who frequent the neighbourhood of Westminster Bridge, and is therefore well practised in giving suitable replies.

[*contd. overleaf.*

All the pilots and their guests were invited to stay for the week-end free of all charge by M. André and the club. In the evening all were invited to a magnificent banquet, where the prizes were presented by the Mayoress. There were over 150 guests at this function, among them Mr. Cunliffe-Lister, son of the Air Minister, who had flown his Leopard Moth over. Around the company hovered Miss Pamela Murray, Mayfair gossip writer, photographing all and sundry.

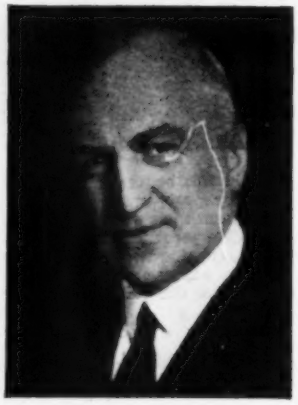
Dinner did not last long, as everybody was anxious to get to the tables and see if they could make Zagrophos and the Casino poorer than before.

By Air to a Tattoo

INTENDING visitors by air to that always enjoyable spectacle, the Tidworth Tattoo (July 31 and August 2-7) are reminded that the nearest civil aerodrome is High Post, 12 miles distant; motor coach transport is available. Meals and accommodation are obtainable at the aerodrome, and night departures (but not landings) can be made by arrangement. Visitors are asked to notify their requirements, if possible, to the Wiltshire School of Flying, High Post, Middle Woodford, near Salisbury. Tattoo seat applications should be made to the Tattoo Box Office, Tidworth.

Imperial Airways New Chairman

SIR JOHN GEORGE BEHARRELL, D.S.O., has succeeded the late Sir Eric Geddes as chairman of Imperial Airways, Ltd., and also of the Dunlop Rubber Co., Ltd. The appointment ensures that the policy which Sir Eric initiated will be continued on the same lines, for the new Chairman has all through his career been the right-hand man of the last one. Born in 1873, Sir George is a Yorkshireman. He was with Sir Eric Geddes on the N.E. Railway, he was his assistant when managing transportation in all theatres of war, he followed Sir Eric to the Admiralty, and served with him on the "Axe" Committee. For years past he has been by the side of Sir Eric on the boards of the Dunlop Company and Imperial Airways. He has also been President of the Society of Motor Manufacturers and Traders, and what he does not know about the transport business is hardly worth knowing.



Russia's Fine Effort

SUCH a flight as that achieved by the three Russian Airmen Gromov, Yumashev and Danilin in the single-engined A.N.T. 25-1 monoplane may fairly be called a triumph. The choice of route over the North Pole not only meant that a forced landing was almost certain death, but also that extremes of climatic conditions had to be faced. The machine, which was equipped with a heated cockpit, de-icers, floatation gear and limited oxygen supply, beat the previous record of Codos and Rossi by 1,000 miles before coming down in a fog in a field some 20 miles from San Diego, California. A petrol leak which developed prevented their continuing some distance farther. The estimated distance covered by the monoplane, which weighed 11½ tons at the take-off, was 6,650 miles and the duration of the flight was over 62 hours. Over half the weight was fuel and a take-off run of 2,000 yards was needed.

The engine is a Russian-built and designed M-34 of 950 h.p. output. It is liquid cooled and of V-12 form.

The highest speed of the flight was probably nearing 120 m.p.h. when the petrol load had diminished; but the average for the whole flight was about 107 m.p.h., little faster than the average of the Fairey monoplane in 1933, which was 93.5 m.p.h. The A.N.T. 25 is similar to the machine used last month by Chekalov, but has dual control.

The greatest height reached was 18,000 feet over the Canadian Rockies, when oxygen was used. The log of the flight was, in brief, as follows: 1.10 a.m. B.S.T., Monday, July 12, left Moscow; 3 a.m. Tuesday, over North Pole at 10,000 feet, temperature about 8° below zero; 1 p.m., approaching Great Bear Lake, Canada; 4.35 p.m. over British Columbia after severe snowstorm; 12 p.m. Tuesday, crossed United States border; 10 a.m. Wednesday, passed over San Francisco; 3.30 p.m. Wednesday, July 14, landed at San Jacuito, California.

Duke of Windsor and Aviation

WE extract the following from July 1 issue of a U.S. contemporary, *American Aviation*:—

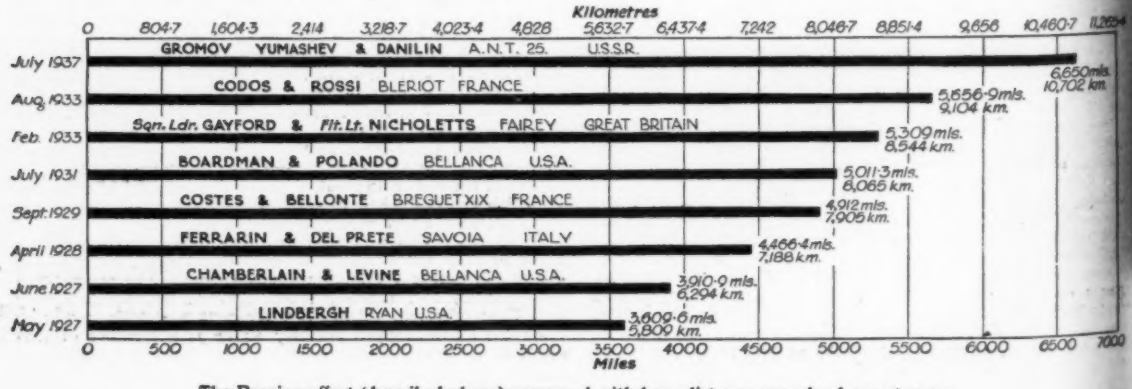
"Confidential advices reaching various Government agencies in Washington indicate that the Duke of Windsor, the abdicated King Edward VIII, is by no means through as a goodwill ambassador for British industry.

"As the Prince of Wales, the Duke acted as emissary for British industry on numerous occasions. American interests remember only too well his visit to South America, which did much to stimulate British trade with that continent.

"Advices reaching this country say that the Duke and his American wife, Mrs. Wallis Simpson, are due for a big prearranged come-back in England after the present furore over his marriage dies down. Then they will begin touring, ostensibly for pleasure, but actually to promote British industry—with particular emphasis on aviation. The Duke's own interest in aviation is well known, and it is believed he will be a potent influence for British aeronautics. He is scheduled to revisit South America later on as an opening wedge for the entrance of British aviation into that continent."

Cirrus Major Type-tested

BLACKBURN AIRCRAFT, LTD., announce that the Cirrus Major 150 has completed its Air Ministry 100-hour type test and received type approval. The international power rating is 132/138 b.h.p. at 2,200 r.p.m., and the maximum power is 149 b.h.p. at 2,450 r.p.m., both on 72-octane fuel.


Kilometres
0 804·7 1,604·3 2,414 3,218·7 4,023·4 4,828 5,632·7 6,437·4 7,242 8,046·7 8,851·4 9,656 10,460·7 11,265·4
July 1937 GROMOV YUMASHEV & DANILIN A.N.T. 25. U.S.S.R. 6,650 mls. 10,702 km.
Aug. 1933 CODOS & ROSSI BLERIOT FRANCE 5,656·9 mls. 9,104 km.
Feb. 1933 Sqn. Ldr. GAYFORD & Flt. Lt. NICHOLETTS FAIREY GREAT BRITAIN 5,309 mls. 8,544 km.
July 1931 BOARDMAN & POLANDO BELLANCA U.S.A. 5,011·3 mls. 8,065 km.
Sept. 1929 COSTES & BELLONTE BREGUET XIX FRANCE 4,912 mls. 7,905 km.
April 1928 FERRARIN & DEL PRETE SAVOIA ITALY 4,466·4 mls. 7,188 km.
June 1927 CHAMBERLAIN & LEVINE BELLANCA U.S.A. 3,910·9 mls. 6,294 km.
May 1927 LINDBERGH RYAN U.S.A. 3,609·6 mls. 5,809 km.
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 6500 7000
Miles

The Russian effort (described above) compared with long-distance records of recent years